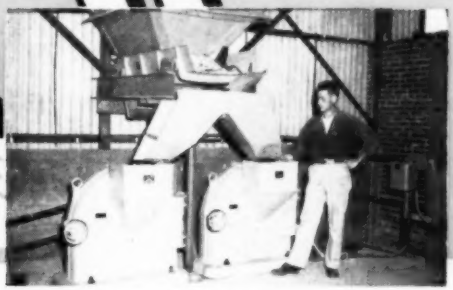
WOOD WORKING Digest



MARCH
1955

In This Issue . . .

- Washington News
- Finishing Stories
- The Story of Chipcore
- How To Ship Furniture
- Complete index, page 5

Accepted as Controlled Circulation Publication at Pontiac, Illinois

WOOD WORKING DIGEST

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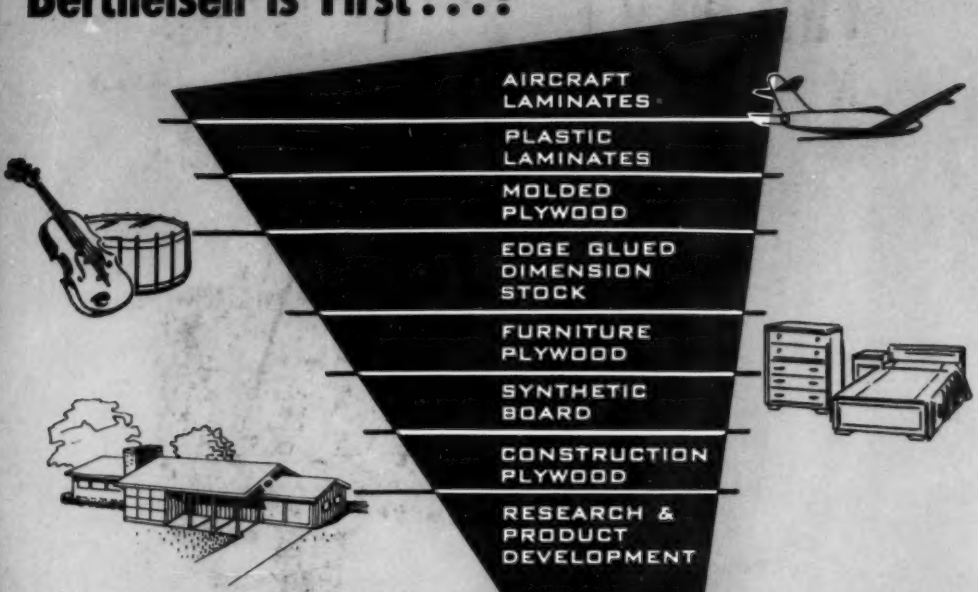
Berthelsen is First . . . !

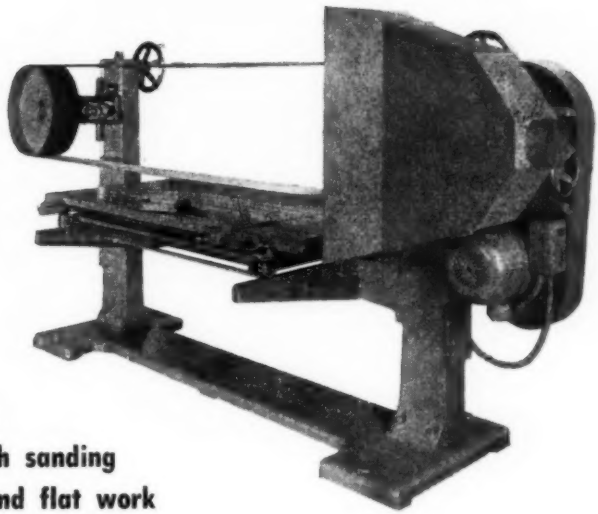


BERTHELSEN
hydraulic automatic
PRESSES

P.O. BOX 1423
LOCKPORT ROAD
JOLIET, ILLINOIS

You won't "burn" wood

with the variable-speed drive of the new "Oliver" Belt Sander



It's unmatched for fast, smooth sanding of mouldings and flat work

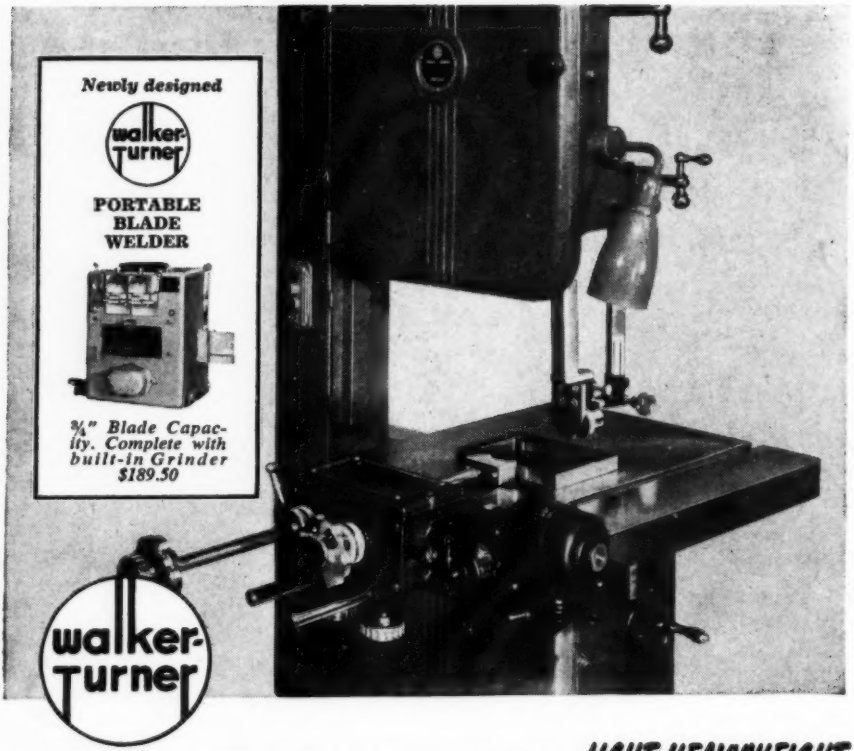
Get all the facts . . . write for Bulletin No. 184

The self-contained "Oliver" No. 184 Sander has unlimited usefulness in furniture, sash and door, and toy factories, as well as in small cabinet shops. It is offered with variable speed drive for belt speeds from 2000 to 6000 f.p.m. Slower belt speeds prevent "burning" of certain woods. It is also offered with motor-on-shaft drive for belt speed of 4500 f.p.m.

With pulleys up it's a Flat Sander; with pulleys down, a Moulding Sander. Sands and polishes line and edge mouldings, irregular and flat surfaces. Also handles small and medium size built-up pieces. Table rolls on ball bearing carriage. Sands 36"x72", and takes work up to 12" high on the table. Uses belts up to 7" wide. Has safety-first reversing switch. Rubber-faced, ball bearing aluminum pulleys have 32" vertical adjustment.

OLIVER MACHINERY COMPANY

Since 1890 **GRAND RAPIDS 2, MICHIGAN**



VARIABLE SPEED DRIVE MAKES THIS *LIGHT-HEAVYWEIGHT* THE UNIVERSAL MACHINE IN YOUR SHOP

The Variable Speed Drive on this LIGHT-HEAVYWEIGHT 16" Band Saw adjusts to the *exact* cutting speed for any stock you work—plastics, composition, wood, non-ferrous metals and even tough steel.

A turn of the Hand Wheel does it—sets blade speeds **in stepless variation from 50 to 450 SFM in low range, or 500 to 4500 SFM in high range**—while the machine is running. An indicator shows the exact speed.

No time is lost in belt-changing, no efficiency is lost because of incorrect cutting speeds or an inadequate speed range. See this versatile precision-built LIGHT-HEAVYWEIGHT at your Walker-Turner Distributor's.

There is much more to the LIGHT-HEAVYWEIGHT story that the Walker-Turner Distributor in your area can tell you. You'll find him expert on all industrial equipment and a specialist on LIGHT-HEAVYWEIGHTS—a good man to know. He is as near as your phone: just look under "TOOLS" in the yellow pages of your local Telephone Directory. Call him today for the helpful information he has to offer.

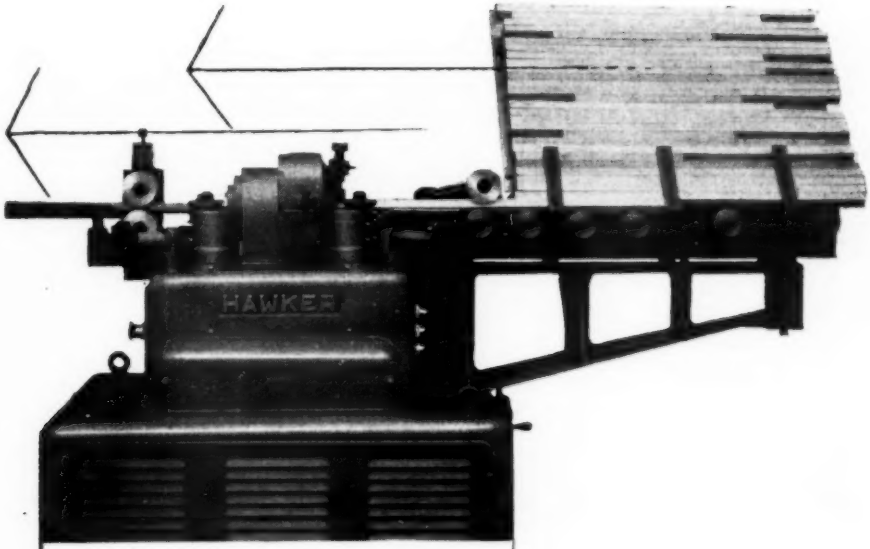
WALKER-TURNER

• DIVISION •

KEARNEY AND TRECKER CORPORATION

PLAINFIELD, N. J.

DRILL PRESSES—Hand and Power Feed • AIR FEED DRILL PRESS ATTACHMENT • RADIAL DRILLS • Wood and Metal Cutting BAND SAWS • TILTING ARBOR SAWS • RADIAL SAWS • JIG SAWS • LATHES • SPINDLE SHAPERS • JOINTERS • BELT AND DISC SURFACERS • FLEXIBLE SHAFT MACHINES



world's fastest dowel machine

now world's easiest!

Now—one man can easily keep the machine—the Hawker rod and dowel machine, the world's fastest—running at capacity, all day long. A number of installations are proving this every day.

The new semi-automatic feeder (operator merely fills rack with rough stock as needed) makes possible even more profitable use of this machine. And it rounds out these standard features:

Minimum of vibration and chatter, no splintering—self-centering stock guide holds stock to within ½" of cutters.

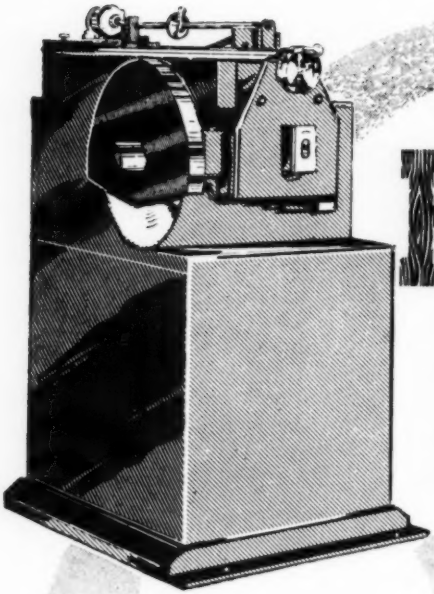
No twisting or spinning of dowel—vertically mounted secondary outfeed rolls prevent it.

Higher cutting speeds, better surface finish—variable speed stock-feed drive lets operator select speed best suited for size and stock.

Write for new Hawker manual. The Hawker Manufacturing Co., 1449 Keowee Street, Dayton 4, Ohio.

PRODUCTION MACHINES FOR WOOD: DOWEL, CHUCKING, SPECIAL

HAWKER



SPECIFY

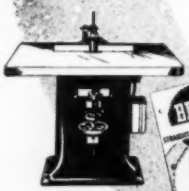
BEACH

the only
all electric automatic

STRAIGHT LINE CUT-OFF SAW*

TILTING TABLE SAW

DOUBLE CUT-OFF SAW



SHAPER

The safest automatic feed ever offered—all electric—no air or hydraulics used! New mounting principle assures straight line action throughout the stroke—on lightest or heaviest work.

Only Beach offers all these features in a Straight Line Cut-Off Saw*:

- **adjustable pushing power on the stroke**
- **foot pedal control for single or continuous operation**
- **selective forward feeding speeds with quick return**
- **quick adjustable stop for length of stroke**
- **hand or power operated without adjustments**
- **sealed ball bearings—no oiling or greasing**
- **built-in saw guards; enclosed ram**

Standard 5 HP motor with ½ HP feed motor. Standard machine with 20" stroke; others to order.

Write today—

for full details on Beach all electric Straight Line Cut-Off Saws and the complete line of Beach woodworking machinery.

*Patent applied for

BEACH
MANUFACTURING CO.
MONTROSE, PA.

WOOD WORKING Digest

MARCH, 1955
Vol. 57, No. 3

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Are Listed on page 160.

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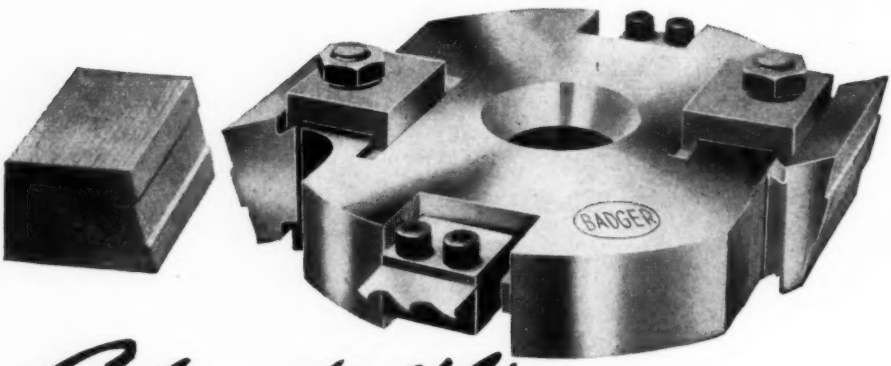
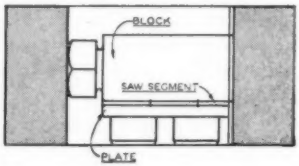


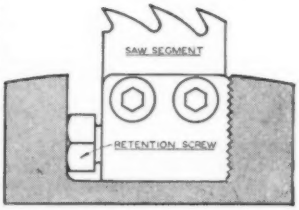
Adjustability OF WEATHER STRIP GROOVE CUTTERS

IS A FEATURE OF BADGER SASH HEADS

The basic design of this BADGER Clamp Type Cutterhead for production of sash parts makes possible the use of only two cutters operating at high spindle speeds. The heavy alloy steel heat-treated clamps, stud, and nuts, (all made of high tensile steel) withstand the high spindle speeds and provide heavy duty clamping for the milled-to-pattern bits. Using two milled-to-pattern bits at a spindle speed of 7200 RPM and a feed rate of 74 FPM gives the desired 16-knife mark per inch finish; the same is true at 9000 RPM and 93 FPM feed, of course. The bits in the illustration will cut the bottom edge of the bottom rail on prefit sash. The top edge of the top rail may be cut using the same head by replacing the two milled-to-pattern bits shown with two bits to make a flat rather than an angular cut.



The special feature of the cutterhead shown is the incorporation of two *adjustable* saw segments to cut the narrow weather strip groove. The saw segment holder is constructed so that loosening the single retention screw will permit moving the holder to any desired position. In other words, the saw carrier can be moved from the center of the head to any point on the left or completely reversed and moved from the center to any point on the right. Also, it can be moved in or out to make a shallower or deeper groove. Adjustment is provided over the entire range, and thus there is: (1) no need for a special head for each groove position; (2) no need for right and left saw segment blocks; (3) no need for special saw segments for deeper or shallower cuts.

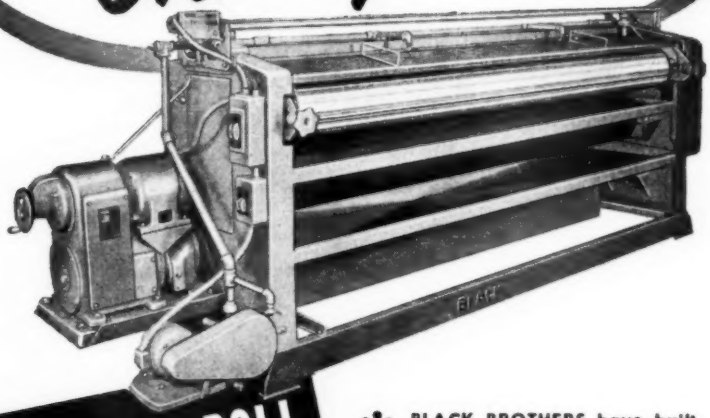


All BADGER heads are designed to give you the *maximum adjustability!* They are dynamically balanced for smooth operation at high spindle speeds. The bits are accurately ground to cut your exact pattern. Send your cutting problems on to Wisconsin today!

WISCONSIN KNIFE WORKS BELOIT, WISCONSIN

Engineers to the Woodworking Industry

High Production Glue Spreaders



RESILIENT ROLL BALL BEARING GLUE SPREADER

✻ **BLACK BROTHERS have built more resilient roll glue spreaders during the past fifteen years than all other manufacturers.**

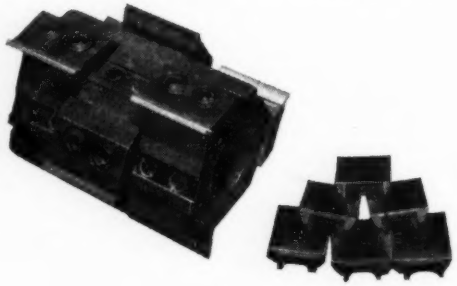
Unmatched in speed, economy, accuracy, cleanliness and quality production . . . the No. 22D Ball Bearing, Resilient Roll Spreader is by far the finest glue spreader available for resins, caseins, and other cold glues. Gluing rolls are deeply covered with the fine synthetic rubber, and are specially grooved to control the amount of glue deposited and to conform to irregularities in the stock. Water cooled doctor rolls are available for use with quick setting glues. Accurate, heavy duty ball bearings are sealed to keep lubricants in, and dirt and glue out. Doctor rolls are heavily *coated* with a highly polished, nonferrous surface to accurately control the glue spread. Investigate the 22D Spreader today . . . write for supplement to Bulletin 11-A.

"If It Is Gluing Equipment — We Have It"

THE BLACK BROTHERS CO., INC.
MENDOTA, ILLINOIS, U. S. A.

American Seating Company reports Carboloy cemented carbide knives increase production runs by—

50 to 1



Molder head and carbide knives used in sticker operation for seat slats at American Seating. Carbide blades require regrinding only after a 5,000-piece run. Although these are six-knife molder heads, only three blades are mounted in the heads.

The Job: Machining slats for stadium and auditorium seats from spongy, gritty southern elm, air-dried. Much harder to cut than kiln-dried.

Problem: To speed up production, while avoiding tear-outs—a great problem unless knives are sharp and machine conditions are right.

Solution: Former steel knives were replaced by Carboloy® Grade 883.

Result: Carboloy carbide knives, reground after every 5,000-piece run as compared with former 100-piece runs, save much downtime and many man-hours for resharpening. Finish quality is greatly improved.

For equipping woodworking tools, Carboloy cemented carbide blanks are made in a wide range of sizes and shapes. These now include, as standard stock items, Braze Type Knife Blanks up to 4" in length, and Solid Knife Blanks up to 10¼" in length. Ask your tool manufacturer. Or, send coupon for technical data and sources of supply.

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company

Carboloy Created-Metals for Industrial Progress

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11128 E. 8 Mile Road, Detroit 32, Michigan

Please send me:

☐ Bulletin WW-20, *Carboloy Cemented Carbides and Their Application in the Woodworking Industry.*

☐ List of toolmakers supplying tools equipped with Carboloy cemented carbides.

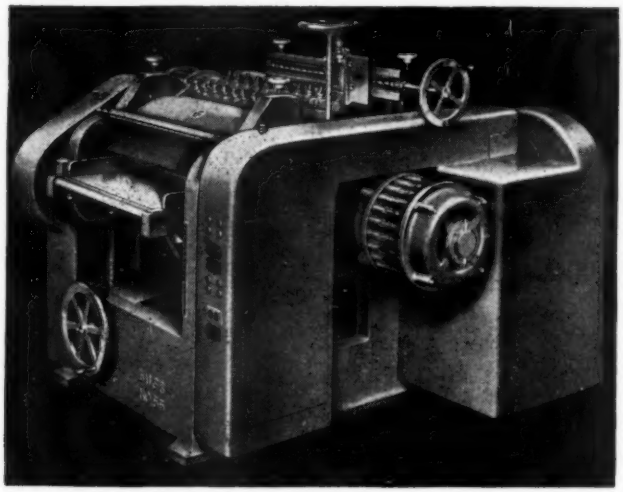
Name_____ Title_____

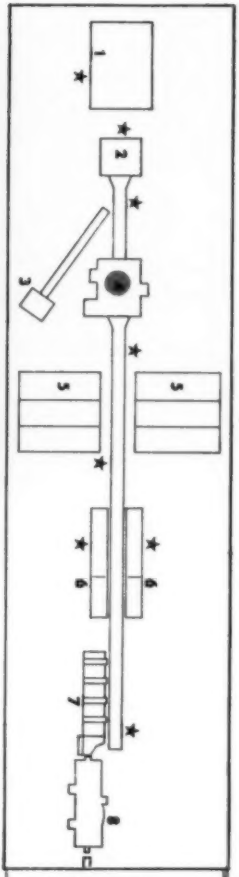
Company_____

Address_____

City_____ Zone_____ State_____

FLOORING MILLS
CUT COSTS WITH
BUSS No. 55 DOUBLE SURFACER!





1 KILN BUNK
2 RIP SAW
3 HOG
4 BUSS No. 55
5 BINS
6 KNOT SAWS
7 FEED TABLE
8 SIDE MATCHER
★ OPERATOR

This compact, rugged, heavy-duty, 20 inch Double Surfacer is saving plenty of money for flooring mill operators in set-ups such as indicated. Running at feed speeds as high as 275 FPM it planes multiple stock from the gang rip saws making evident the knots and defects for ready trimming and squaring prior to entering side matcher.

The Buss No. 55 is years ahead in design and construction, built to give you more and better production with the very minimum of maintenance required. Write for complete description. Just ask for Bulletin No. 55.

In addition to the No. 55, the BUSS line contains single and double surface cabinet planers for finest finish planing and the MICRO-SURFACER for planing hardboard and other very thin materials.

Consult us on any planing problem

BUSS
SINCE 1862
MACHINE WORKS

PLANER SPECIALISTS EXCLUSIVELY SINCE 1862

234 EIGHTH STREET • HOLLAND, MICHIGAN

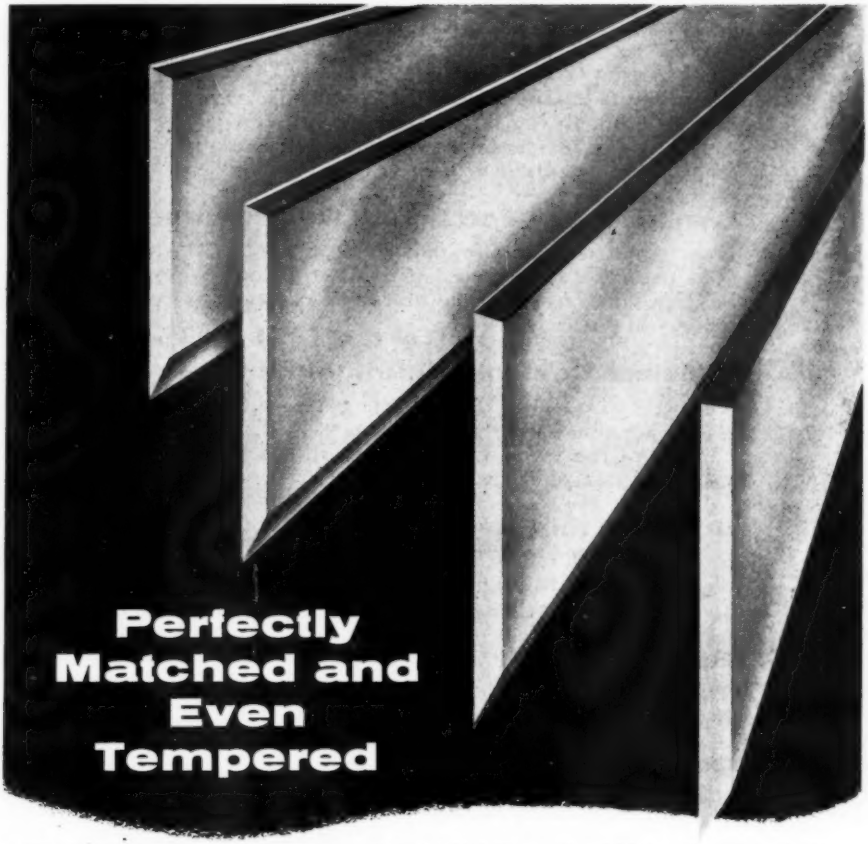
to help you select the proper mortising and boring tools for fast, accurate production

Here's a handy guide you'll want for regular reference. New GREENLEE Catalog 34-M gives complete information on hollow chisels and bits, router bits, machine bits and drills, dowel bits, countersinks, plug cutters, and other high-quality tools that increase efficiency of woodworking machines.

This well-illustrated, 20-page book shows tools in detail . . . quickly gives data on sizes and types for easy selection of tools best suited to your work. Also includes tool sharpening instructions and a helpful wood screw boring chart.

If you haven't a copy, or need more copies, write today for Catalog 34-M. Greenlee Tool Co., Division of Greenlee Bros. & Co., 2133 Herbert Ave., Rockford, Illinois.

TOOLS FOR CRAFTSMEN
GREENLEE



SIMONDS THIN PLANER KNIVES

Secret behind the *smoother* finished surfaces you get with Simonds Thin Planer Knives lies in their *uniform* thickness and *even* temper. Not too hard, not too soft, every knife wears the same, cuts the same. So that every Simonds Knife is always in the cut.

Perfectly matched, Simonds Thin Planer Knives won't cause vibration. Simonds extra-tough cutting edge resists nicking, stays sharp longer. Gives you more and smoother cutting.

It actually costs you *less* to turn out *smoother* surfaces with Simonds Thin Planer Knives. Now stocked by your Simonds Industrial Supply Distributor.

For Fast Service from Complete Stocks Call your SIMONDS Industrial Supply DISTRIBUTOR

SIMONDS SAW AND STEEL CO. FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon. Canadian Factory in Montreal, Que. Simonds Divisions: Simonds Steel Mill, Lockport, N. Y. Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

How to prevent trouble when room temperature is below 75°

When room temperature falls below 75° you approach the critical point in the safe use of many glues. If you cure glue lines at room temperature you will be interested in the advantages offered by Perkins Casein Glue.

+ Consistently good bonds at low temperatures

Even when temperature falls as low as 40° you can safely cold press a casein glue line. On cold days when it would be impossible to use some glues you can continue production when you glue with casein.

+ Moisture Content Control less critical

Very dry wood—too dry for safe gluing with many adhesives—can be glued with casein. Except for extremes, moisture content of the wood has no effect on the satisfactory performance of a casein glue.

+ Easier to mix and to use

Perkins Casein Glues do not require the addition of a catalyst—just mix with water before use. Spreading is relatively simple and assemblies can be stored in an unheated area while curing.

+ Perkins Casein Glues offer superior bonds

Time has proven the strength and durability of casein glue. If you desire a glue joint as strong as any but with a minimum of gluing problems you can be sure that there is a Perkins Casein Glue to meet your needs.

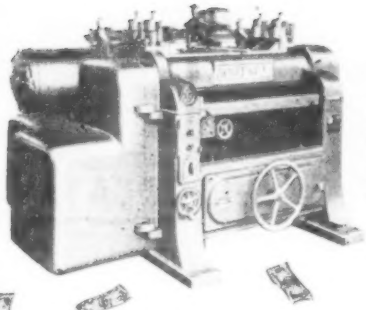
WRITE TODAY FOR COMPLETE INFORMATION—NO OBLIGATION

Perkins Glue Company

Lansdale, Pa.

High Point, N.C.—Shawano, Wis.
West Memphis, Ark.—Kitchener, Ontario—La Chute, Quebec

OTHER PERKINS PRODUCTS INCLUDE: Urea, Phenolic and Resorcinol Resin Adhesives; Casein and Vegetable Glues; Prepared Hide Glues; Gluing Equipment and Glue Room Supplies.



WHITNEY 206 SIX-ROLL SINGLE SURFACER

A heavy duty surfacer for highest quality rough and finish planing. New design for easier operation. Rugged construction to maintain accurate production under severe service.

How Soon . . . .

Does an Investment in New Equipment pay off?

The Answer is: It starts paying off immediately! — in more and faster production, better quality work, fewer rejects, less handling, less fatigue and increased productivity of your operators.

New Whitney Machines give you the added insurance of dependable operation and maintained accuracy over the years. Require little attention, assure minimum maintenance and low operational costs. Your investment in Whitney Equipment is an investment in higher plant efficiency, less waste, increased profits.

Why wait to invest in profits. Before you buy, check first to see if Whitney makes it. Let Whitney Machines start "paying off" for you right now. Write, wire or phone us today for latest information.

BAXTER D. WHITNEY & SON, INC.
WINCHENDON, MASS.

WHITNEY BUILDS

SINGLE SURFACERS
DOUBLE SURFACERS
FACING PLANERS
AUTOMATIC SHAPERS
HAND SHAPERS
VARIETY SAWS
BACK KNIFE LATHES

Whitney

FOR FINEST PERFORMANCE

118 YEARS OF EXPERIENCE AND KNOW-HOW

Serving the Industry Since 1852

WOODS MOTORS are SUPERLATIVE

in

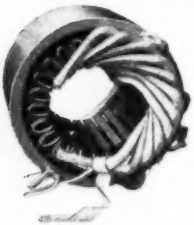
★ DESIGN ★ ★ MATERIALS ★ ★ WORKMANSHIP ★ ★ PERFORMANCE ★

To Motorize

is to Modernize . . .

To Modernize

is to Economize.



EXTRA YEARS OF SERVICE!

Each individual coil of the winding is insulated and separated by a double layer of insulated tape.

Slipping belts and defective motors may be costing you more than you think! At surprisingly small expense, highly efficient ball bearing Wood's Motor Arbors or Shaftless Motors can be installed to provide real economy and top performance.

Precision-Built and "full tape insulated," these exceptional motors are available in a wide variety of types and range from one to one hundred horse power—or will be built to your own specifications.

Write today for descriptive material or ask our Engineering Department for the solution of any special motor problem.

MOTOR DIVISION

S. A. WOODS MACHINE CO.

27 DAMRELL STREET

BOSTON 27, MASS.

Weyerhaeuser Pre-Cut Wood Parts require minimum storage space at Breneman-Hartshorn Inc.

Straight grain and even texture of Weyerhaeuser Wood Parts mean high quality, few rejects.

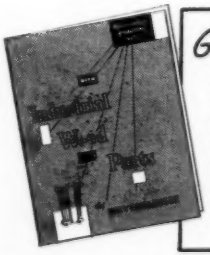
Why Breneman-Hartshorn Uses Weyerhaeuser Wood Parts

Breneman-Hartshorn Inc., of Muskegon, Michigan, is one of the country's leading producers of shade rollers. Mr. J. J. Schalk of their purchasing department reports that they are thoroughly satisfied with the quality of Weyerhaeuser Wood Parts, and that the prompt delivery helps keep production on schedule.

Here are three reasons why Weyerhaeuser Wood Parts may be of value to you:

- Straight grain, even texture and lack of pitch make Weyerhaeuser parts easy to work, with a minimum of costly rejects.
- The high quality of the parts means a uniformly high quality product—a very important point for the continuing success of any company.
- Weyerhaeuser Wood Parts arrive when promised, preventing the loss of valuable production time.

If you use wood in your products, it will pay you to investigate the advantages of Weyerhaeuser Pre-Cut Wood Parts. They are available in various stages of completion . . . cut to size, molded and end worked, edge-glued and surfaced, in various combinations to meet your production requirements. Weyerhaeuser engineers will help determine the type of part that can save time and money in your plant.



Get the facts!

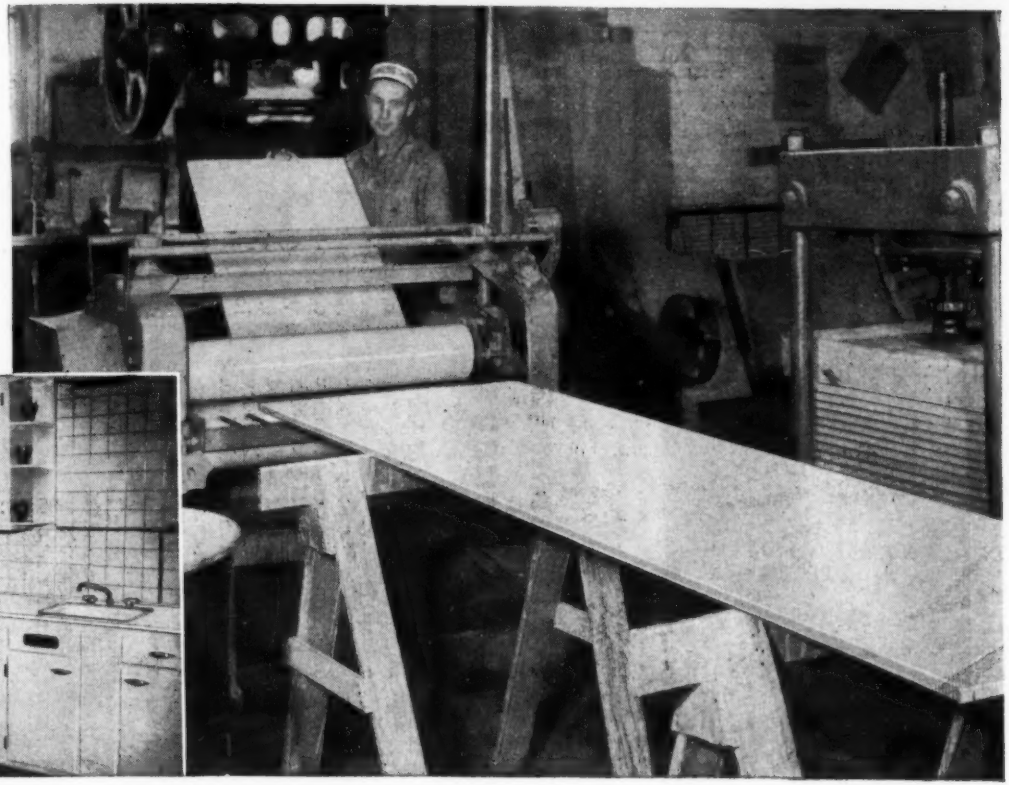
Send for your copy of this new booklet — it tells how many leading manufacturers are increasing their profits by using Weyerhaeuser Pre-Cut Wood Parts. Find out if you can save time and money in the same way.

Weyerhaeuser
Sales Company

Industrial Wood Parts Department
Room 2155-A
400 West Madison, Chicago, Illinois

LAMINATING with KWIK-KLAMP

The Sanderson-Harold Co. Ltd., Paris, Ontario, uses National's KWIK-KLAMP in laminating plastic sink and table tops and in fabricating a variety of kitchen furnishings. Photo at right shows plastic sheeting on a glued-off sink top core ready for pressing.



SIMPLIFIES STACK HANDLING

ready-for-use resin gives machining bonds in 1 hour

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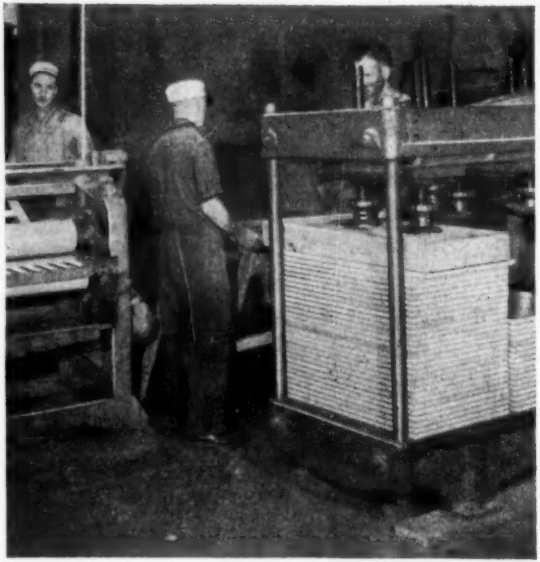

KWIK-KLAMP is used to bond screen-backed hardboard to cabinet door frames. Several stacks are cycled in the press. Clamping time is as low as 20-30 minutes per stack.

KWIK-KLAMP securely laminates plastic to wood (or wood to wood) in as little as 20-30 minutes—reaches machining strengths in only an hour. Presses can be emptied in time for reloading without bar clamping and the handling of heavy clamped up stacks. Curing rooms and the messiness of glue mixing and heating are eliminated.

KWIK-KLAMP is used directly from the drum. The process is simple *and continuous*. Using a press such as that pictured, all you do is glue off cores and cover them with plastic and backup sheets, building a stack to pressload height and inserting the load in the press. Then you build and press two more stacks in other sections of the press. By this time (an hour or less) the first stack can be removed, ready for machining. Replace it with a new stack and continue the cycle in the press, building a new stack and removing an old one every 20-30 minutes.

RESYNS®
National
ADHESIVES

SPECIAL OFFER! See for yourself how the KWIK-KLAMP process works. Write for 5 gallons of KWIK-KLAMP—*on a trial and approval basis.*

NATIONAL ADHESIVES. Woodworking Department WD (Resin Division), 270 Madison Ave., New York 16. 3641 So. Washtenaw Ave., Chicago 32. 735 Battery St., San Francisco 11. 1511-23 So. Main St., High Point, N. C.

For

unmatched performance, job after job . . . specify

VICTORY

CARBIDE-TIPPED

SAWS

Regardless of the cutting job you put before VICTORY Carbide-tipped saws, you enjoy three big advantages: —

- **INCREASED PRODUCTION**
- **REDUCED OPERATING COSTS**
- **SMOOTHER, FASTER CUTTING**

WRITE TODAY!

Send for literature or ask your supplier for full information on VICTORY carbide-tipped saws.

On many difficult sawing jobs, VICTORY carbide-tipped saws are cutting 40 to 100 times longer than ordinary saws before sharpening. Users also experience less down-time on machines and benefit thru reduced sharpening costs. Be sure to investigate these advantages for your plant.

Victory CARBIDE SAW & TOOL CO.

3856 N. ASHLAND AVE.
CHICAGO 13, ILLINOIS

Sharpening & repair shop at
73 W. Industrial, P.O. Box 3026
Memphis, Tennessee

Fast Delivery on 276 standard sizes and types of Weldwood Hardboard!

Nominal Thickness Inches	Standard Sizes Feet	Average Caliper Inches	Aver. Wt. Lbs. per Sq. Ft.
	Weldwood Standard Hardboard		
1/10	4 x 12	.104	.59
1/8	4 x 16 down to 4 x 1	.134	.75
3/16	4 x 16 down to 4 x 1	.186	1.02
1/4	4 x 16 down to 4 x 1	.242	1.33
5/16	4 x 12 down to 4 x 1	.310	1.67
	Weldwood Tempered Hardboard		
1/10	4 x 12	.104	.62
1/8	4 x 16 down to 4 x 1	.134	.78
3/16	4 x 16 down to 4 x 1	.186	1.08
1/4	4 x 16 down to 4 x 1	.242	1.40
5/16	4 x 12 down to 4 x 1	.310	1.75
	Weldwood Black Tempered Hardboard		
1/10	4 x 12		
1/8	4 x 12 down to 4 x 1	.134	.78
3/16	4 x 12 down to 4 x 1	.186	1.08
1/4	4 x 12 down to 4 x 1	.242	1.40
	Weldwood Prime-Coated Hardboard		
Standard 1/8	4 x 12, 4 x 8	.134	.75
Walltuf 1/4	4 x 12, 4 x 8	.240	1.17
Tempered 1/8	4 x 12, 4 x 8	.134	.78
3/16	4 x 12, 4 x 8	.186	1.08
1/4	4 x 12, 4 x 8	.242	1.40

Nominal Thickness Inches	Standard Sizes Feet	Average Caliper Inches	Avor. Wt. Lbs. per Sq. Ft.
	Weldwood Standard Dekalux		
1/8	4 x 12 down to 4 x 1	.132	.85
3/16	4 x 12 down to 4 x 1	.182	1.09
	Weldwood Tempered Dekalux		
1/8	5 x 16 down to 4 x 3	.132	.85
3/16	5 x 16 down to 5 x 5; 4 x 16 down to 4 x 3	.182	1.09
1/4	5 x 16 down to 5 x 1; 4 x 16 down to 4 x 1	.243	1.55
	Weldwood Walltuf Hardboard		
3/16	4 x 16, 4 x 12, 4 x 10, 4 x 8	.180	.90
1/4	4 x 16, 4 x 12, 4 x 10, 4 x 8	.240	1.17
	Weldwood Dekatile		
1/8	4 x 16 down to 4 x 3	.134	.84
	Weldwood Dekaleather		
1/8	4 x 16 down to 4 x 3	.138	.84
	Weldwood Dekaply		
1/2	4 x 8	.500	2.45
3/4	4 x 8	.750	3.75
	Weldwood Perfoboard		
1/8	4 x 8 down to 4 x 1, 2 x 2	.134	.75
3/16	4 x 8	.186	1.02
1/4	4 x 8	.242	1.33

Nominal Thickness Inches	Standard Sizes Feet	Average Caliper Inches	Average Weight Lbs. per Sq. Ft.
	Weldwood Hardboard Exterior Siding		
1/4	12" x 8', 12" x 12', 12" x 16', 16" x 8', 16" x 12', 16" x 16', 24" x 8', 24" x 12', 24" x 16'	.242	1.40
5/16	12" x 8', 12" x 12', 12" x 16', 16" x 8', 16" x 12', 16" x 16', 24" x 8', 24" x 12', 24" x 16' (Sizes in inches and feet)	.310	1.75

In addition to this wide range of standard sizes, we offer direct mill shipments of Weldwood Hardboard cut to your specifications.

When you order hardboard, ask for Weldwood Hardboard. It costs no more and you get immediate delivery on most items. For details call any of the 73 United States Plywood distributing units in principal cities. For a complete listing of Weldwood Hardboards and information on working and finishing hardboard, send the coupon.

WD 3-55

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55 West 44th Street, New York 36, N. Y.

Please send me FREE Weldwood Hardboard booklet.

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Company.....
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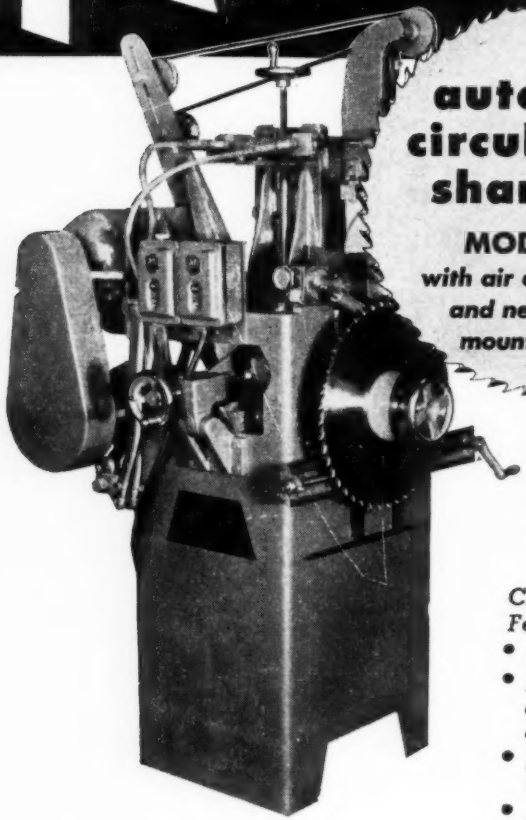
HANCHETT



automatic circular saw sharpener

MODEL 724

with air operated shift and new pedestal mounting stand

Low-cost, full-automatic sharpening for RIP and CROSS-CUT saws from 6" to 36" diameter.

Check these Production Features:

- *Accurate Action.*
- *New Mechanism, controls bevel grind on cut-off teeth.*
- *Double Side Head, vertical — horizontal.*
- *Adjustable Tooth Cam.*

Write us about our complete line of Saw Sharpeners for all types and sizes of Saws.

HANCHETT MANUFACTURING COMPANY

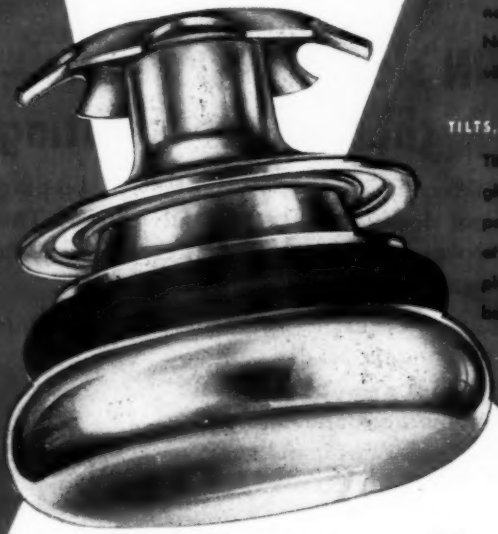
World's largest manufacturer of knife grinding and saw sharpening machinery

COVEL SAW SHARPENERS · HANCHETT KNIFE GRINDERS

MAIN OFFICE—Big Rapids, Michigan **WEST COAST—Portland, Oregon**

New SUPER-SILENT SWIVEL GLIDE for tubular metal furniture

FLOATS ON RUBBER
SLIDES ON STEEL



MORE SILENT THAN EVER BEFORE

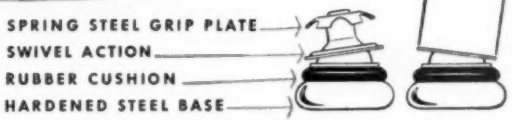
Hardened steel base is completely insulated from parts that make contact with tubular steel leg by newly designed rubber cushion. No metal-to-metal contact . . . all vibrations absorbed by cushion.

TILTS, SWIVELS, LOCKS IN TIGHT

Tilting swivel base allows new glide to stand flat on floor or carpet even though legs are mounted at an angle. Spring steel grip plate is easily driven into tubing but prevents removal of glide.

NICKEL OR BRASS FINISH

Available for Standard Tubing Sizes

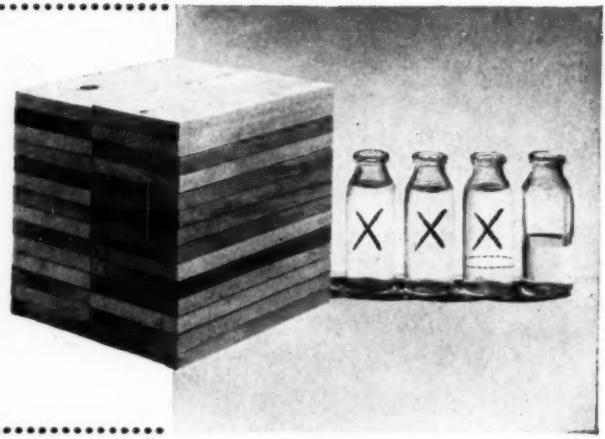


UNITED-CARR FASTENER CORP.

31 Ames Street, Cambridge 42, Massachusetts

MAKERS OF DOT *FASTENERS*

At 60% relative humidity, a cubic foot of wood holds nearly 3½ pints of water. If the R.H. drops to 10%, the same cubic foot of wood will lose about 2¾ pints. If this happens too fast the wood tends to warp, check or split.



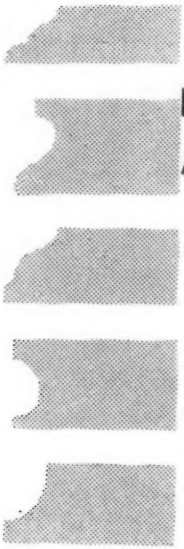
HUMIDIFICATION slows moisture loss—stops warping, checking or splitting

Armstrong Steam Humidifiers are the automatic way of keeping the relative humidity from dropping too fast and too far. The wood will not split, warp or check and the EMC (equilibrium moisture content) will never go below the desirable level.

Armstrong Steam Humidifiers are easily installed—much like unit heaters. They operate for pennies a day and are guaranteed to satisfy. For complete details send for 12-page Humidifier Bulletin No. 1775 (no obligation)—contains complete information about the desirable moisture content of hygroscopic materials, physical data, prices, methods of installation and other necessary data about Armstrong Steam Humidifiers. Write:

ARMSTRONG MACHINE COMPANY
863 Maple Street, Three Rivers, Michigan

ARMSTRONG STEAM HUMIDIFIERS



NOW!

PERFECTLY MACHINED EDGES AUTOMATICALLY—*AT LOW COST*

SUPREME
AUTOMATIC SHAPER

Regular or irregular shapes . . . molded or plain edges . . . any part that requires edge finishing can be handled by the Supreme Automatic Shaper.

The piece to be machined is attached to a jig and template which is fed past the cutter by means of a sprocket chain feed. The jig is held in contact with the guide roller by compressed air. By feeding the work in the direction in which the cutters are rotating, a perfect finish, without breaking, is obtained. Even sharp corners are machined with ease.

For small parts, multiple jigs may be used to provide greater production at high rates of speed. Where air power is not available, the Supreme Automatic Shaper can be furnished with foot lever control.

Extremely low in cost, the Supreme Automatic Shaper provides other economies as well. Unskilled labor can be used to attain perfect work. Maintenance is held to an absolute minimum by the simple design and construction.

WRITE TODAY FOR COMPLETE DETAILS

SUPREME WOODWORKING MACHINERY CORP.
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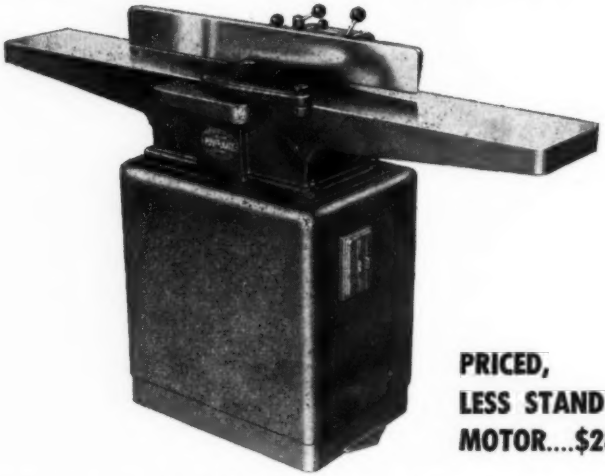
PRESENTING

THE NEW POWERMATIC

MODEL 60—8" JOINTER



**PRICED,
LESS STAND &
MOTOR....$289.00**

The NEW Powermatic 8" Jointer is designed to meet the requirements of Industrial, Sash and Door, Contracting, School, Vocational and Cabinet shops. The extremely heavy duty castings are made from the finest grey iron, machined and ground to close tolerance. An extra long 64" Bed insures a perfect finish on long material. Both tables are adjustable in dovetail ways making it possible to maintain height between outfeed bed and cutting circle of the knives. Exclusive center mounted Table fence has positive lock stops at 45° and 90°. Totally enclosed stand features built in chip chute. Complete information sent upon request.

Manufactured by

POWERMATIC MACHINE COMPANY
McMinnville, Tenn.

What is your WOOD-BONDING problem?

APPLICATION AND CURING? The "Penacolite" adhesives cure at room temperature (minimum 70°F.) in a few hours, or in just a few minutes at accelerated heat. They are easy on cellulosic fibers since curing is carried out under neutral conditions.

DURABILITY? "Penacolite" bonds retain their strength through temperatures ranging from -40°C. to wood-charring heat, are unaffected by the stresses of vibration or shrinking and swelling. These bonds effectively resist oils, greases, most solvents and most acids. And they're waterproof in both salt and fresh water.

STRENGTH: Under all conditions of service "Penacolite" adhesives, when fully cured, form bonds as strong as the woods they join.

VERSATILITY? "Penacolite" adhesives are finding favor in many wood-bonding jobs, large or small, curved application or straight. They are also recommended for the bonding of most thermo-setting and some thermo-plastic resins and plastics, as well as natural and some synthetic rubbers.

STORAGE? "Penacolite" adhesives are usable for at least a year when stored at room temperature.

Write today for our free booklet describing the "Penacolite" Adhesives. We will be glad to make recommendations concerning your bonding problem.

KOPPERS COMPANY, INC.

Chemical Division, Dept. WWD-74, Koppers Bldg.
Pittsburgh 19, Pennsylvania

KOPPERS®

PENACOLITE® RESORCINOL ADHESIVES

The original waterproof, room-temperature-setting adhesives

Savings!

PASSED ON TO YOU

The greatly increased demand for Huther Brothers superior quality Carbide Tipped Saws has resulted in lower manufacturing costs. These savings are being passed on to the user in the form of lower prices. It is now possible to purchase the finest quality Carbide Tipped Saws and Cutters available at prices that are no higher than would be paid for ordinary Carbide saws.

Send for our new price sheet which lists our new lower prices on standard Carbide Tipped Saws.

HUTHER BROS. SAW MFG. CO., INC.
1280 UNIVERSITY AVE. ROCHESTER 7, N.Y.

HUTHER BROS.

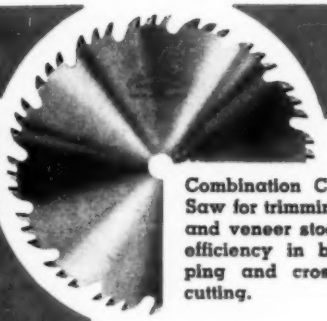
TUNGSTEN CARBIDE TIPPED

Rip, Combination and Crosscut SAWS

GUARANTEE

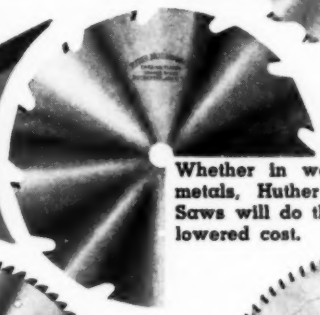
Huther Bros. Saw Manufacturing Co., Inc., guarantees that all Huther Saws are as true as it is possible to make them. Over 70 years in the business of manufacturing saws enables us to guarantee every blade we make.

SAW MAKERS FOR OVER 70 YEARS

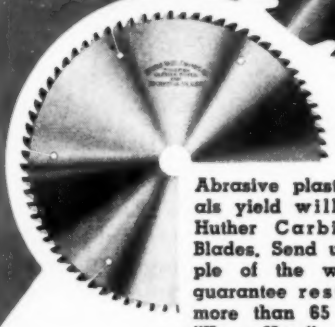


Combination Carbide Saw for trimming panel and veneer stock. High efficiency in both ripping and cross grain cutting.

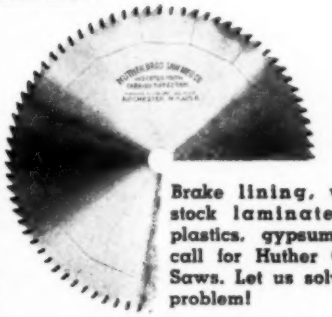
Here's a typical Huther Saw which leads the industry for use on power feed rip saws. Faster output, trouble-free operation and glue joint cuts are assured.



Whether in wood, plastic or non-ferrous metals, Huther superior quality Carbide Saws will do the job better, faster and at lowered cost.



Abrasive plastic materials yield willingly to Huther Carbide Saw Blades. Send us a sample of the work. We guarantee results with more than 65 years of "Know How".



Brake lining, veneer stock laminated with plastics, gypsum board call for Huther Carbide Saws. Let us solve your problem!

Write today for CATALOG CT 100

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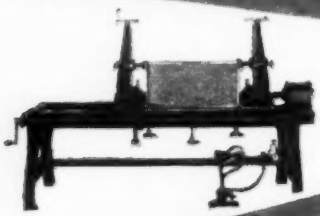
MAKE TOP QUALITY DRAWERS AT HIGH PRODUCTION LEVEL WITH

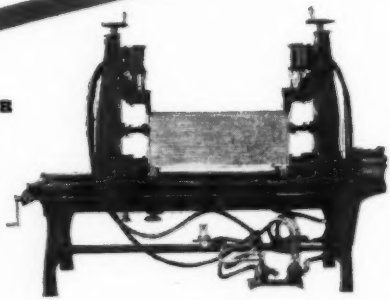
LANCASTER DRAWER MAKING EQUIPMENT

HUNDREDS OF SATISFIED USERS!

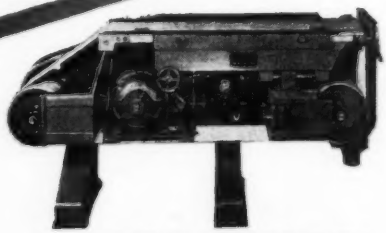


NO. 215 Air Operated Drawer Clamping Machine. For drawers with male dovetails on both ends of drawer sides.

NO. 230-B
Air Operated Drawer Clamping Machine with Overhead Pressure. For drawers with male dovetail on front end of drawer side and female dovetail on back end of drawer side.



NO. 210-B
Motor Driven Dovetail Glue Spreading Machine. Clean! Fast! Glues pair of sides in one operation.



NO. 600
Motor Driven, Ball Bearing, Drawer Sanding Machine. Dependable! Can adjust angle of belt travel; thus, saving wear on belt when extreme angle is not needed.

Write for Full Information

J. M. Lancaster, Inc.

INVENTORS. MANUFACTURERS. DISTRIBUTORS
AIR OPERATED FURNITURE CLAMPING MACHINERY
P.O. BOX 2462 - GREENSBORO, N. C.

THE HALLMARK

of Quality

Represented in the Entire Knife Line. And Introducing a New High Speed Steel Thin Knife

Stalter EDGE TOOL CO.

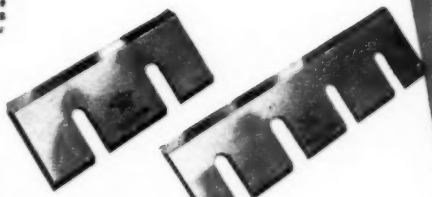
THIN HIGH SPEED STEEL

SHAPER STEEL

TUNGSTEN TEMPER

An entirely new and improved High Speed Steel Thin Knife is now being presented by the Stalter Edge Tool Company under the well known name of Tungsten Temper. To provide a better knife Stalter has added an exclusive new NON-SLIP back. Metallurgical study has increased the edge strength. Order a set of Stalter Thin Knives and prove the advantages in your own plant.

The same new developments are incorporated in the Stalter Shaper Steel. The apex in shaper steel manufacture.



TUNGSTEN TEMPER

For use on modern fast moulders and stickers the Stalter Tungsten Temper (High Speed) or Thermo Temper (Carbon) provides the finest in slotted thick knives.

THERMO TEMPER

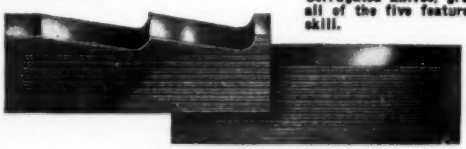
High Speed or Carbon Steel Planer Knives can be furnished to your specifications. Stalter Planer Knives can be supplied solid or inlaid. Write our engineering department for their recommendations.

Tenon Knives furnished in High Speed or Carbon Steel, when made by Stalter, are the tops in durability, balance, and stamina.

Accurate interpretation of your patterns, ground into one of the selected Stalter Knives, provides you with trouble free operation. Send Stalter your pattern or sample.

Shaper knives made from Stalters premium shaper steel insures long lasting edges and safe operation.

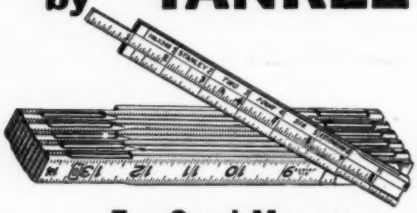
Corrugated knives, ground-to-pattern, straight or bar length includes all of the five features of the Stalter knife making reputation and skill.

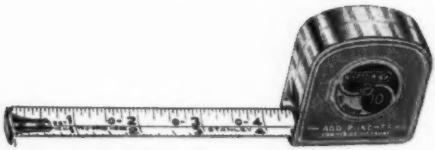


Stalter EDGE TOOL CO.

GRAND RAPIDS, MICH.

Professional Woodworking Tools by "YANKEE" and STANLEY

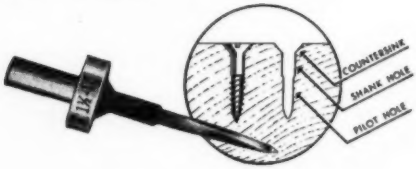




For Good Measure . . . Zig-Zag or Pull-Push

New Stanley Zig-Zag Extension Rule. Extra thick first leg has brass slide for inside measurements. Rule opens to even numbers – marking gauge at 2", 4", 6", 8", etc. *6 ft. No. X246 Extension Rule – $2.10.*

New Extra Wide Stanley Pull-Push Rule. ¾" wide, extra rigid, extra long – 10 ft. blade unreels from compact 2" case to make out-of-reach measurements easy. *10 ft. No. 3610W Rule – $2.39.*



For Good Screw Driving . . . Start to Finish

New Stanley Screw Mate Combination Wood Drill and Countersinks. 3 boring jobs at once! Pilot hole, shank hole and countersink in one operation with hand drill, power drill or drill press *and* Screw Mates. 24 sizes from ½" x No. 5 to 2½" x No. 12. Tool steel – correctly heat treated. *No. 1525 Screw Mate – 75¢.*

Finish the job to perfection with the famous "Yankee" Spiral Ratchet Screw Driver. A real time and work saver. This fine tool does the job – a push is all you put behind it. The ratchet drives or draws and the handle returns automatically after each stroke. *"Yankee" No. 130A Spiral Ratchet Screw Driver – $7.70.*

See, try and buy these professional tools at your hardware store. Write Stanley Tools, 793 Elm St., New Britain, Conn. for free tool catalog.

STANLEY Tools "YANKEE"®

The Stanley Works • Tools • Electric Tools • Hardware • Steel • Steel Strapping

It Will Pay You To CHECK These Facts!

Here's What

WILLIAM'S "NO-NIFE" HOGS

✓ Can Do For You:

1. Increase The Heating Value Of Your Wood Scrap!

When reduced to chip form by hogging, wood burns more evenly—gets *all* the heat value possible. Unhogged slabs, trimmings, large pieces, restrict air flow, smother fire, result in inefficient combustion.

2. Improve Quality Of Wood Flour And Sawdust!

Processing wood scrap with a Williams Hog, for resale in the form of wood flour or sawdust, assures more uniform grinding and sizing—much lower labor costs—reduced power requirements.

3. Reduce Handling Cost As Much As 75%!

One man firing wood in chips can handle the same tonnage as would require three men if fuel scrap remained in awkward lengths and pieces that necessitate individual handling.

4. Your Operation May Permit Complete Automatic Handling

Williams has made many automatic installations to hog and convey waste wood to stoker or boiler at tremendous savings in handling expense. Other installations to automatically grind, separate and package wood flour and sawdust result in phenomenal reductions in cost.

Williams equipment will actually pay for itself in a few months, then continue to produce extra profits for many years. Investigate now!

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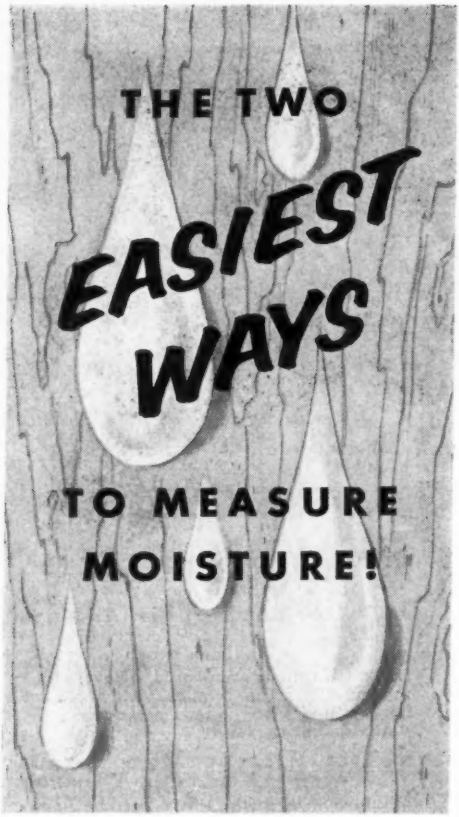
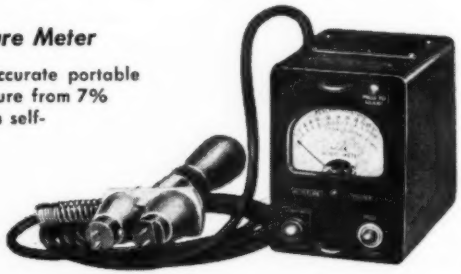


WESTON *ALL-PURPOSE*
MOISTURONIC
Moisture Meter

Here is the most versatile moisture meter, yet the simplest and easiest to read. Measures up to 150% moisture on the double-range scale (readings above 30% for comparative purposes). Utilizing the precise resistance principle, it has the same dependability typical of all WESTON instruments. Available in both battery and A-C types, with a sturdy carrying strap. Weight less than 10 lbs. Send for bulletin W7B.

WESTON *Midget Moisture Meter*

The smallest, most convenient and accurate portable meter. Instantly indicates wood moisture from 7% to 30%. Weight less than 4 lbs. with self-contained batteries. Unequalled for quick, portable use—checking lumber, lath, shingles, plaster walls, plywood, etc. Send for bulletin W2C.



WESTON *Moisture Meters*

WESTON Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark 5, N. J.

From bare wood to finished job...

Black & Decker Speeds Your Work

. . . by drilling faster and cleaner!

B&D 1/4" Heavy-Duty Holgun*

Now with *25% more power* to make faster, cleaner holes for better doweling, tighter assembly and neater work. Capacity: 1/4" diam. holes in steel; 1/2" diam. in hardwood—greater capacity with Hole Saws.

. . . by increasing accuracy, relieving fatigue!

B&D No. 12 Scrugun*

Features *50% more power* with choice of positive or adjustable clutch for faster, more accurate driving with less spoilage. Drives up to No. 12 wood screws, plus nuts, machine screws & self-tapping screws.

. . . by keeping glue temperature uniform!

Black & Decker Glue Pots

Precise thermostatic control *keeps* glue at proper 150° temperature, insures uniform assembly. Two-quart capacity and fast heating time speeds work. Sealed Nichrome heating element for longer life.

. . . by eliminating hand sanding!

B&D Utility No. 88 Sander

Here's an orbital sander to turn out satin-smooth jobs without hand sanding! Testimonials from professional woodworkers prove this. King-size 4 1/2" x 9" sanding plate extends beyond tool; allows sanding right up to obstructions.

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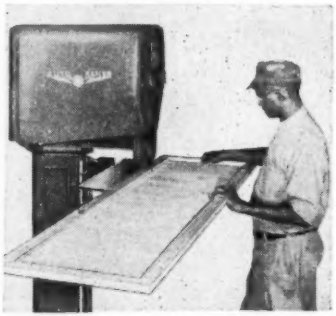
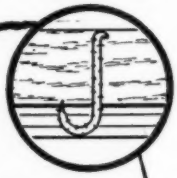
Ruling Permits Auto-Nailers on Cleated Plywood Panels

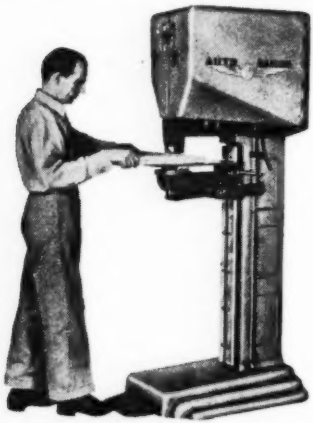
Efforts of the Armed Forces to cut costs all along the line have brought out Amendment-1 to Federal Specification PPP-B-601 (which has superseded JAN-P-105 and NN-B-601b) which reads "6.5.1 One type of fastening that has been found satisfactory for securing plywood to cleats is the type formed from a roll of knurled wire in a machine that drives the fastener through the cleat and plywood and the fastener is clinched into the plywood."



Auto-Nailer makes panels fast



Cross-section of cleat attached to panel by Auto-Nailer. Auto-Nailer makes, drives and clinches a special knurled wire nail . . . 3 nails-a-second.



Auto-Nailer minimizes splitting, saves production time—resulting in lower cost of shipping containers without sacrifice of structural integrity. This Amendment-1 confirms the experience of many wood fabricators who have used Auto-Nailers profitably over the years.

AUTO NAILER
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AUTO-NAILER CO. 265 Marietta St., N.W. Atlanta, Ga.

OUR HERITAGE . . . OUR DEBT

Our heritage as Americans is made up, in part, of our great natural resources. We truly are blessed with the richness of our land—literally, above and below the ground that we proclaim as the "good old U.S.A." Unfortunately, very early in the history of our nation we lacked the necessary respect for the wealth of some of these resources. One of these was the forest-land.

Fortunately, the Forest Service—which is celebrating its fiftieth year—has done much to educate us to a better use of our heritage in the timber available. We have learned much through the efforts of this organization about cutting and replanting our forest areas.

As woodworkers we owe a debt of service to the Forest Service Department. This organization has helped to guarantee an inexhaustible source of supply for our industry: an industry which followed too long the policy of "use and forget."

We have paid a substantial part of our debt and, perhaps, we should term our share from now on as necessary cooperation. Wood plays an important part in our American heritage and tradition. However, it is necessary, and will be for sometime to come, to educate the public in understanding the advantages, values and uses of wood.

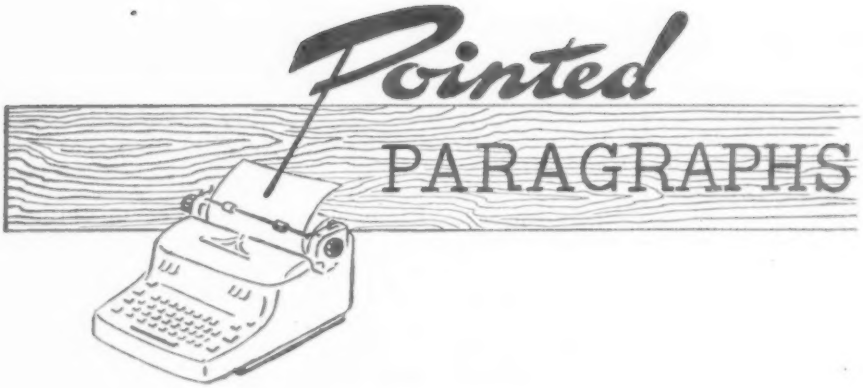
It looks as though 1955 would be a wonderful year in gaining a better understanding of good forestry practices and appreciation of the advantages of wood over other materials. "House Beautiful" has helped in publicizing its "Pace Setter" home. This beautiful house, built in the great state of Texas, has been constructed from a variety of woods. To quote from the magazine, "The structural use of wood with all its inherent natural beauty" has been made an integral part of the house.

There will be a Golden Jubilee Anniversary for the Douglas Fir Plywood Association this year. This group has done a great deal already to advance wood utilization.

Of course, there are many other things being planned particularly for those within the industry. Here are just a few of the events on the agenda: Wood Office Furniture Institute meeting in March; Southern Pine Exposition in April; the Forest Products Research Society Meeting in June; and the various furniture shows scheduled for this spring.

Let's fully appreciate our heritage; recognize our dependency upon all who are advancing public understanding and resolve to carry our share of the load. In this way we can work hand in hand to make the next ten years an era of maximum utilization of the whole crop and, of course, an era of expansion and prosperity for the woodworking industry.

E. McDaniel
Editor



Major decorating trend for 1955 is expected to be wood paneled walls. Factors stimulating this movement are said to include the necessity for maintaining the value and appearance of existing homes and the search by builders for distinctive features to promote sales of new houses in an increasingly competitive market.

Construction of a new $3,000,000 wood products laboratory building is expected to begin this summer on the campus of the State University of New York College of Forestry. Wood will be used extensively in the building. The most modern machinery is to be installed which can be used for research purposes and for actual training in veneer production, wood preservation, etc.

Summerwood content in second-growth Douglas fir is under study at the Oregon State College Forest Experiment Station as part of a broad program of research on second-growth timber. Summerwood is that part of the annual growth ring formed in the summer and is darker and denser, or stronger. Because of this, estimation of summerwood in timber is used as one basis for its selection for structural purposes.

Be sure to see the "new look" in the Finishing Section of this issue. Send us your problems and we'll try to answer them. If you care to send us "tips," "short-cuts," or solutions to problems in your own plant, we'll pay regular contributor rates for anything published.

The Architectural Woodwork Institute plans to launch a wood window promotion. This will be helpful along with other splendid efforts being made by other organizations in the industry.

Meeting on oak wilt was held recently at Columbus, Ohio. Pathologists, entomologists, and research foresters met to consider the hazard of oak wilt spread in lumber; possible spread by insects; damage caused by oak wilt in certain states; when infection takes place; improvements in techniques for identifying oak wilt trees and surveying for the disease from the air and

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DUO-FAST AIR TACKERS cut production costs on case backs, drawer guides, and numerous other jobs.

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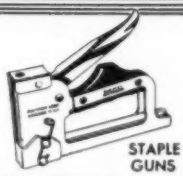
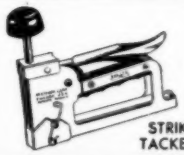
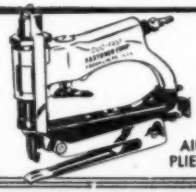


STAPLE GUNS



STRIKE TACKERS



AIR PLIERS

FASTENER CORPORATION

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the ground; and research on more effective treatment of diseased trees in control operations.

The National Association of Home Builders has retained the Atlantic Research Corporation, a consulting firm in Alexandria, Va., to set up a building library and information bureau for the new National Housing Center, now under construction in Washington, D.C. The library will be one of the world's largest and most complete in the building field.

The Forest Products Research Society will begin construction of its new executive office building in June at Madison, Wis. The building will combine many of the newest and latest forest products, materials and techniques in existence today. Architects are Eason, Anthony, McKinnie & Cox of Memphis, Tenn.

Twenty representatives of woodworking industries from northeastern United States and Canada went back to school at the State University College of Forestry, Syracus, N.Y. They went to school for a refresher course on kiln drying and gluing techniques. A number of courses, held by various organizations, are planned for the next several months. Read about them in this issue and plan to attend or send representatives from your firm.

Wood holds a big lead over other materials in American home building, the latest nation-wide survey of the Bureau of Labor Statistics shows. The survey covered non-farm, one-family dwellings started in the first quarter of 1954: 82% of the houses were framed with lumber.

A new fabricated bench, for use as a church pew and for other mass seating installations, has been introduced to the construction field by the U. S. Plywood Corp. It is supplied in continuous lengths up to 10'.

Post-market comments on the various furniture markets indicate: that Chicago had the best "peacetime market"; that New York and High Point followed the Chicago pattern; that modern design led in case goods at Chicago; and that a strong 19th century influence was evident at Grand Rapids.

American Furniture Mart officials plan midseason markets at Chicago with "Official Preview Market Showings," May 2 to 6, and Oct. 31 to Nov. 4. The regular summer market will be held June 20-30.

National Association of Home Builders has announced a plan for building a $2,000,000 housing research village at Grand Rapids, Mich., to test the effectiveness of new ideas in housing design, construction and materials.

Two new plywood products have been introduced by Walton Plywood Co. One is a non-skid overlay for boats and allied marine use called EverMarine decking grade. The other is a new pre-cut overlaid beveled siding called EverSide.

IF YOU WANT BETTER FINISH...
LESS WASTE... MORE ACCURACY...
HIGHER PROFITS...

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Geared to YOUR production

S–824 SINGLE SURFACER

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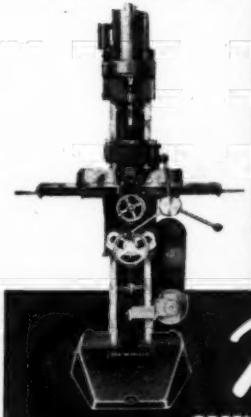
G-232 HYDRAULIC KNIFE GRINDER

T-20 MORTISER



The machines shown here are but a few of those manufactured in our big new modern plant which turns out a full line of up-to-the-minute woodworking machinery. Our staff of design engineers constantly seek newer, finer techniques and quality controls. All moving parts — shafts, pulleys, heads are dynetrically balanced for smooth vibration-free service and long productive life. Full details of any Newman Machine is yours on request.

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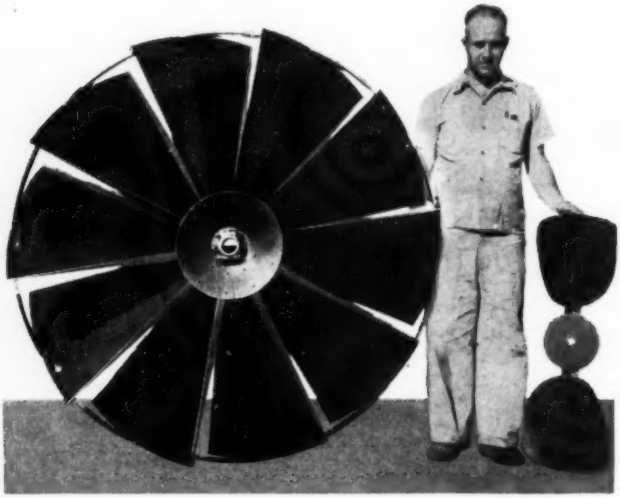
G-16 PEDESTAL TYPE HEAD GRINDER

Newman MACHINE CO., INC.

GREENSBORO, NORTH CAROLINA, U. S. A.

Which Fan Would You Choose For Your Dry Kiln ?



This MOORE multiblade 60" dia. fan operating at SLOW speed of 241 RPM against 1/10" static pressure requiring 1.33 brake H.P., produces 16,000 cu. ft. of air per minute.

Power requirements decrease as temperature increases — approximately 20% reduction at 180°F.

This 2-blade 36" dia. fan operating at HIGH speed of 1140 RPM against 1/10" static pressure requiring 1.33 brake H.P., produces 7715 cu. ft. of air per minute.

	Air Delivery Per H.P.	Comparative Air Delivery
36" 2-blade Fan	5,143 cfm.	100%
60" Moore Fan	12,030 cfm.	234%

Moore Kilns season over 70% of the kiln-dried lumber produced in U. S. and Canada—Let this record be your guide!

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Comments from THE NATION'S CAPITAL

By Arnold Kruckman
Washington Correspondent

The Reciprocal Trade Agreements program is the major subject of discussion in Congress. As forecast in these comments, over 200 witnesses appeared before the Ways and Means Committee of the House. Over 150 protested vigorously against a further extension of the program, and urged that the import taxes be raised, not lowered.

One of the strange features of this whole transaction is the fact that the three-year extension and the reduction of the trade agreements tariff urged by the Ways and Means Committee came unanimously from the Democrats in the House. This presented the curious situation of a proceeding that was strenuously opposed by the great majority of smaller business units, but which was urged by the Republican President and the rest of his Administration as well as the Democrats in the House and in the Senate. This is necessarily written before the bill reported by the Ways and Means Committee of the House, under control of the Democrats, has had an opportunity to be debated on the floor. It should be remembered that there are 232 Democrats in the House and 203 Republicans. In the Senate there are 48 Democrats, 47 Republicans and 1 Independent who votes with the Democrats.

The names of some of the trade organizations and industrial units that were represented in the effort to arrest the adoption of the Trade Agreements Act is an unusually interesting list. It included the United States Wood Screw Service Bureau, Hardwood Plywood Institute, Insulation Board Institute, Hardboard Association, American National Cattlemen's Association, Seafarer's International Union of North America (AFL), Wine Institute, American Flint Glass Workers' Union of North America (AFL), Tuna Research Foundation, Hat Institute, Inc., Cordage Institute, Amalgamated Lace Operatives of America (Ind.), American Knit Handwear Association, Inc., Carpet Institute, Inc.,

National Authority for the Ladies' Handbag Industry, Onondaga Pottery Company, Dairy Industry Committee, American Glassware Association, Diamond Match Company, California Fish Canners' Association, and many others. These organizations and units represented the army of workers and operators who opposed the extension of the Trade Agreements Act from one year to three years, and the increase of the tariff in many cases more than 50%.

Congressman "Wint" Smith of Kansas, one of the most independent political factors in the Congress, says the mere fact the Democrats are in the majority does not mean that they can control all legislation. During the past few sessions both Democrats and Republicans have crossed political lines. Many members will no doubt continue to deflect from Party regularity.

Congressman Smith points out a great many committees have Southern Conservative Democrats as their chairmen. The chairmen of the Agriculture Committee in both House and Senate are both Conservative Southern Democrats and both strongly favor the same parity program that was supported by the Republicans in the last session. It is quite likely when the Reciprocal Trade Agreements bill is reported on the floor that both Republicans and Democrats will vote against the Administration demand, and the Democratic Ways and Means Committee program. It should be interesting to watch what happens to this report because it is bound to have a strong affect upon other similar reports which are expected to draw support from both Democrats and Republicans.

It is interesting that the Democratic Ways and Means Committee report was put on the floor by a vote of 20 to 5. It is generally assumed that Representative Reed of New York, and a number of Republicans from states like Pennsylvania, Ohio, Illinois and other midwestern states, will lead the fight against the bill by proposing individual amendments aiming at greater tariff reduction for various trades and articles produced in this country. This leadership is expected to bring out a veritable flood of amendments. Unquestionably many of the proposals for modification made in the committee will again be brought to the front by their unsuccessful sponsors on the floor of the House.

The suggestions in question cover a wide range and, in general, are aimed at increasing the tariff or quota protection for American industry against certain types of wood products, glass, oil, chemicals, electrical equipment, machine tools, lace and many other items from abroad. It scarcely requires repetition that these products, made in Europe and Asia by cheap labor with materials that cost amazingly less, are sold in the United States for prices almost incredibly lower than they can actually be produced in this country; many demonstrations of the type of goods made outside of the United States at prices that seem almost fantastically improbable have been exhibited in Washington since the first of the year. Many were placed on sale in some shops in order to demonstrate the low cost in contrast to the price that had to be obtained by the American-made goods even to cover actual cost.

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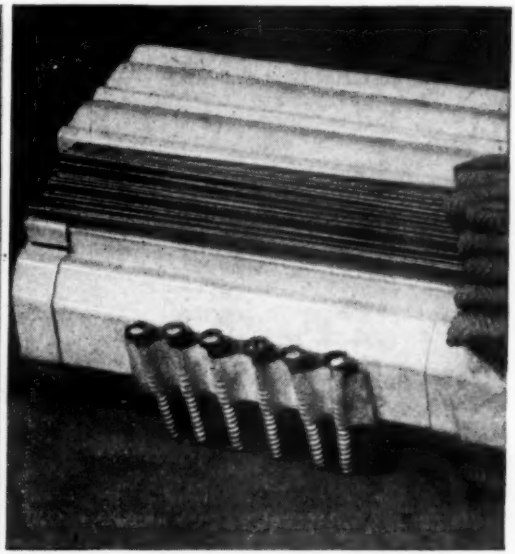

Continental's Envelope and Taped Screws Solve Problems when Fasteners Must Accompany a Product!

Here's how they can ease some of your packaging difficulties

If your product demands that fasteners must be included with it, the chances are that Continental can help cut your handling costs. Continental's taped screws and envelope package screws have surprised many producers with time saving results. They eliminate costly hand sorting, short counts, and loose units in your package.

All tapes and envelopes are filled automatically by machine and can be printed with your trade mark and directions prior to delivery.

Continental also offers you many other cost-saving suggestions. It will pay to talk it over with them. Let them prove that you can *always count on Continental.*

Continental Screw Co.

Manufacturers of Holtite Fastenings

NEW BEDFORD, MASSACHUSETTS, U. S. A.

The present Reciprocal Trade Agreements Act will expire June 12. As requested by the President, the Committee-approved bill would permit the President to negotiate reciprocal agreements that could cut tariffs 5% below existing levels each year for three years, cut any rates currently above 50% of an item of value down to that level, or cut tariffs to 50% of the January 1, 1954 rate on imports not now coming into this country in appreciable amounts.

Following the recommendation of a Commission headed by Clarence Randall, the Committee struck out a provision that would have given the President unilateral power to cut tariffs on goods not imported in appreciable quantities. Another change written into the bill resulted from a protest by Secretary of Agriculture Benson. This revision made clear that no reciprocal trade agreement could interfere with existing laws requiring quotas on farm commodities when such imports threaten domestic farm price support program. Secretary Benson was afraid the original wording of the bill would have weakened protection against imports of some foreign farm products.

Still another amendment, favored by the committe, is designed to speed up as well as strengthen the President's authority to suspend the application of tariff reductions on articles manufactured or produced in countries found to discriminate against American commerce.

Congressman "Wint" Smith says the reciprocal trade issue is bound to be one of the major controversies in this and any other Congress. He points out it has been an issue in Congress for 150 years. And he suggests the same arguments will be used now as in previous times. He says the Republican Party will be in a new role. It formerly championed the protective tariff.

The proponents of the reciprocal trade policy, as outlined and recommended by the President, say it is necessary for us to lower our tariffs in order to help: (1.) International relations; (2.) Reduce foreign giveaway programs; (3.) Improve the economic conditions of our allies; (4.)Enlarge our farm markets, and (5.) Promote employment in this country.

Congressman Smith underlines that these are general arguments, but he says it is pretty hard for employees who are employed in the woodworking industries, in the shoe, watch, coal, glassware, woolen, dish and farm industries to believe these arguments when they find themselves laid off and without jobs because of foreign competition.

It is interesting that at this time the Council of State Chambers of Commerce made a comparison of average Federal salaries for 20 Civil Service job classifications with salaries for the same jobs in private industry, in 14 selected cities. The comparison also indicated what the Federal salaries for these jobs would be with the pay raise proposals of the President and with those sought by Senator Johnston, chairman of the Senate Post Office and Civil Service Committee, and 20 Senators in their proposed bill, S. 67. The study was made by

Eugene F. Rinta, research director of the Council, formerly FBI economist. He found—

1. Average Federal salaries in 10 different jobs are higher than private business pays in all the 14 selected cities.

2. In 4 cities (Atlanta, Boston, Minneapolis-St. Paul and Philadelphia) salaries for all 20 job classifications are less than the government pays.

3. In 6 more cities (Buffalo, Dallas, Denver, Memphis, Milwaukee and St. Louis) salaries for only 1 of the 20 jobs are higher than the Federal.

4. Only 4 of the 14 cities (Chicago, Cleveland, Los Angeles and San Francisco) have salary scales about equal to Federal pay. In those cities salaries are higher than the Federal scale in 8 - 10 of the 20 jobs and lower in the remainder.

5. The 5% average increase proposed by the President would create a further substantial disparity between Federal and private business salary scales in over half of the 20 job classifications and would reduce to 5 the number of jobs where business in any of the 14 cities pays more than the government.

6. The 10% average increase provided in S.67 would, of course, widen the gap between Federal and business salary scales, to the advantage of the Federal scales, much further.

The study urges Congress to "examine thoroughly the justification for further pay raises and, to the extent that it may raise salaries, suggest how the increased salary costs are to be financed."

The study added that the Administration's proposal would raise Federal salary costs a minimum of $340 million a year, and those of Senator Johnston and his co-sponsors, from $740 million to almost a billion dollars.

Contractors in the woodworking industries are keenly interested in the lively discussion concerning the $7 billion program launched by the Administration to build new schools in all parts of the country. The Business Defense Services Administration of the Department of Commerce feels that this is one of the most potentially prosperous prospects that has arisen for a long time.

The proposal is for a three point Federal aid program. First, the Federal government is to purchase $750 million worth of government school bonds issued by local communities if they are unable to sell these bonds elsewhere at reasonable interest rates. Second, $150 million is to be supplied to match state funds in setting up initial reserve funds to cover payments on bonds issued by state-wide school building agencies. The schools are to be constructed to be leased to communities which cannot finance their own building because of debt limits. Third, $2 million is to be supplied as outright grants to match state funds to help build schools in communities too poor either to build or lease new schools on their own responsibility.

In addition, it is urged that Congress authorize $20 million in Federal funds for a three year period. During the first year $5 million is to be appropriated to finance half of the administrative costs of state programs. These are designed to overcome obstacles to local school financing or to provide additional state aid in local school districts.

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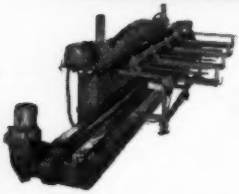
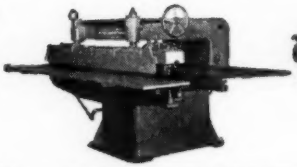
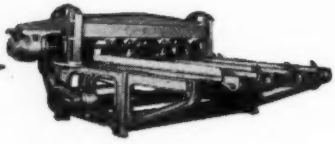


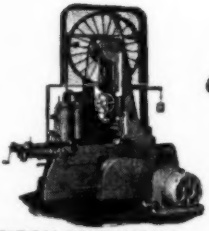
VENEER JOINTER — Traveling head eliminates shifting. No chain feed, no stock wobble. Perfectly joints bundles of veneer up to four inches thick. Sizes from 90" to 212". *Described in M-J Jointer Bulletin.*



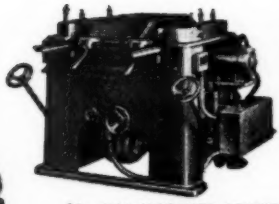
VENEER SPLICER—Makes precision tapeless joints. Adjusts automatically for varying thicknesses of veneer. Welded steel frame with 49" throat clearance at right. *Bulletin No. 50.*



No. 438-H MULTIPLE CUT-OFF SAW—Cuts long boards into short pieces . . . square cuts large sheets . . . cuts any number of grooves. An excellent plywood sizer. *Described in M-J Bulletin No. 435-H.*



VERTICAL BAND RESAW — Eight feed rolls eliminate stock wobble. 54" Twin Band Resaw. Combination band, rip resaw. Sizes 48" to 60". *Described in Resaw Bulletin.*



No. 326 MATCHED JOINTER —For sash and door, furniture, box factories and many special applications. Adaptable for jointing hogshead staves. Unequalled for "T" and "G" work. *Bulletin No. 326.*

No. 442-MT COMBINATION SAW — Versatile machine for ripping, cross cutting, grooving, dadoing, beveling, mitering. Cuts up to 48" wide and rips up to 50" wide. Handles large stock easily. *Described in Bulletin No. 442-MT.*

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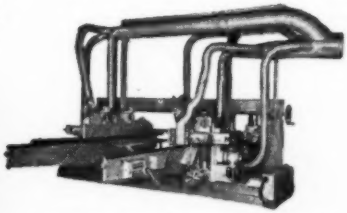
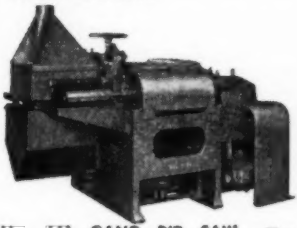


No. 400 DOUBLE-END TENONER — —Sizes up to 20' to fit your requirements. Will square-cut up to 96" ahead of trim saws. Accessories expand its usefulness. *Described in Bulletin No. 400.*



No. 441 GANG RIP SAW —For highest production on the toughest gang ripping jobs. Six power driven feed rolls—12", 19", 24" saw spacing . . . up to 125 HP . . . variable feed drive up to 300 FPM . . . glue joint accuracy. *Described in M-J Bulletin No. 441.*

No. 477 CUT-OFF SAW —Capacity equals two or three swing, straight line or roller carriage cut-off saws depending on type and condition of stock. Excellent for box work. *Bulletin No. 477.*

No. 600 DOUBLE CUT-OFF SAW — Accurate production at high feeding rates. Time and labor saving attachments include cope motors, dado arbors and other devices for specific needs. Larger sizes available. *Described in Bulletin No. 600.*

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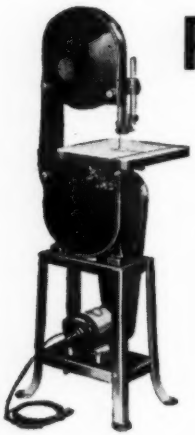

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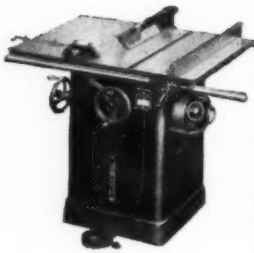

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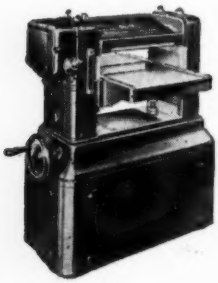

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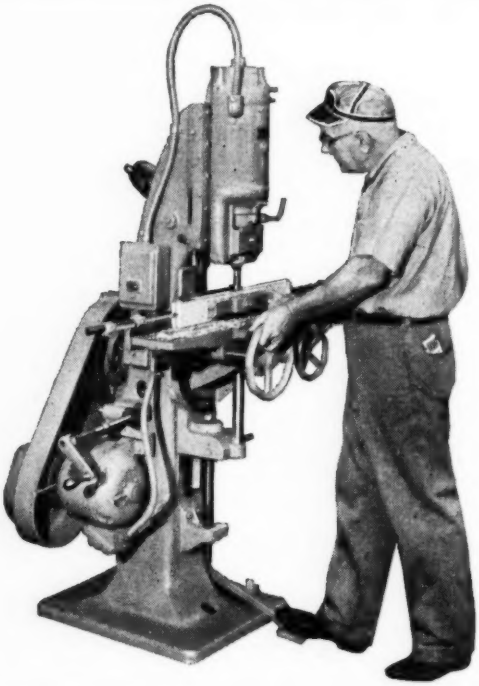

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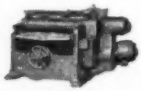

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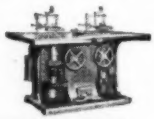

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CHIPCORE

The Kreibaum Process

by T. J. Connelly

President, The Dean Company

WITHIN the last couple of years a number of new forms of chipcore have appeared on the American market. Manufacturers in various fields are realizing the possibilities of chipcore as a core stock for plywood and as a base for plastics and other coatings in plywood-type products.

Among the various forms of chipcore now available in this country is the German Kreibaum process. Developed by Otto Kreibaum, this process has been in successful full-scale production in Europe for the last five years or more and was introduced to this country in 1954.

With the construction of new plants, this vertical process extruded chipcore is now available in quantity to the American woodworking industry. It is offered both as a core material and in plywood panels in stock sizes as well as in custom sizes.

Kreibaum Plants in Operation

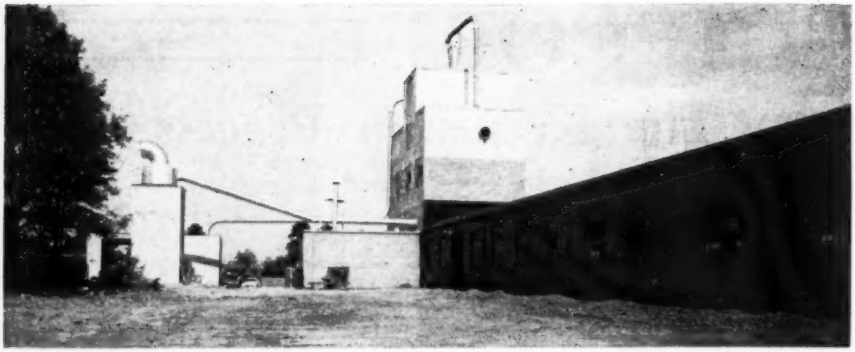
The Dean Company, Chicago, a manufacturer and importer of hardwood lumber and veneer, controls through a subsidiary, the manufacturing rights for the Kreibaum process in the United States, Mexico, the West Indies, Japan and the Philippines. Dean sells the complete Kreibaum plant, including all machinery. They also can offer technical advice in building, installing and operating the plant; consulation on special problems; and reports on new procedures and findings resulting from continuing research.

Kreibaum plants now in operation in this country include a new Dean subsidiary, the Dixie Chipboard Co., which now manufactures only the chipcore in the raw state; and the Jasper-American Corp., an affiliate of the Jasper Corp., Jasper, Ind. The Dixie Chipboard Co. located at Rural Hall, N.C., has steady sources of raw materials and an adequate labor supply, and is conveniently situated to serve the increasing number of furniture and wood products manufacturers in the area. The all-concrete plant building has some 15,000 sq. feet of floor space, most of which will be used for storage purposes.

The Jasper-American plant, at Henderson, Ky. will be a year old in May. This company produces chipcore fabricated into plywood and other plywood-type products, such as plastic-surfaced panels, doors, completed table tops, furniture parts, etc. They also can build complete finished TV cabinets and other finished products.

Another American plant, Chipboard Products, Inc. will be in operation by April 1955, at Grant's Pass, Ore. Distribution and sale of its chipcore will be handled through the Dean Co.

A new Kreibaum plant will also be completed in April in Yucatan, Mexico. Other Kreibaum plants are either in operation or being built in Canada, South America, Europe, South Africa and Australia.



View of new Dean Company Kreibaum chipcore plant recently opened at Rural Hall, North Carolina.

Options for Kreibaum plants in certain areas of the United States are now outstanding.

Need for Chipcore

Interest in the various new forms of chipboard is the result of demand for a lower cost alternate for lumber core; and an interest in conservation of timber resources.

It is difficult to get good, high quality lumber for core stock, and along with the decreasing supply of lumber there seems to be an increasing market demand.

Vertical process chipcore is comparable to a high grade lumber core. Chipcore also eliminates the danger of sunken joints.

Chipcore is cheaper than lumber core for plywood. Time and labor are saved. Lumber core has to be kiln-dried, ripped to width, rough planed, glued into cores electronically or otherwise, surfaced and trimmed to exact size.

By contrast, chipcore is available for most needs in easy-to-lay panels, minimizing waste and greatly reducing the time and labor. When core panels need to be butt-jointed (as for 5-ply panels longer than 4 feet), the large size and uniform thickness of Kreibaum chipcore make it a fairly simple matter.

Lumber core has certain advantages such as machining the edges, but by lumber-banding the edges of chipcore this handicap has been overcome. Edge banded with lumber on all four sides, chipcore plywood is still cheaper than lumber core plywood.

Conservation Factors

Because the basic ingredients of chipcore are waste products of the logging, and lumber and woodworking industries, or cordwood, chipcore helps conserve our natural wood resources. It helps eliminate the waste expense and disposal problem for sawmills, reducing the original cost of lumber production. More important, it eliminates the necessity of cutting prime hardwood for plywood core stock.

Because of a lower cost for cores, chipcore will help veneer users to offer the more desirable genuine hardwood veneers on furniture at prices the public can afford to pay. There is a trend toward chipcore—it is here to stay—and has a definite place in the woodworking picture now and in the future.

Unlike the common batch processes where the wood chips are oriented horizontally, in the Kreibaum process the chips are oriented in a vertical position (at right angles to the surface of the board) and the board is extruded

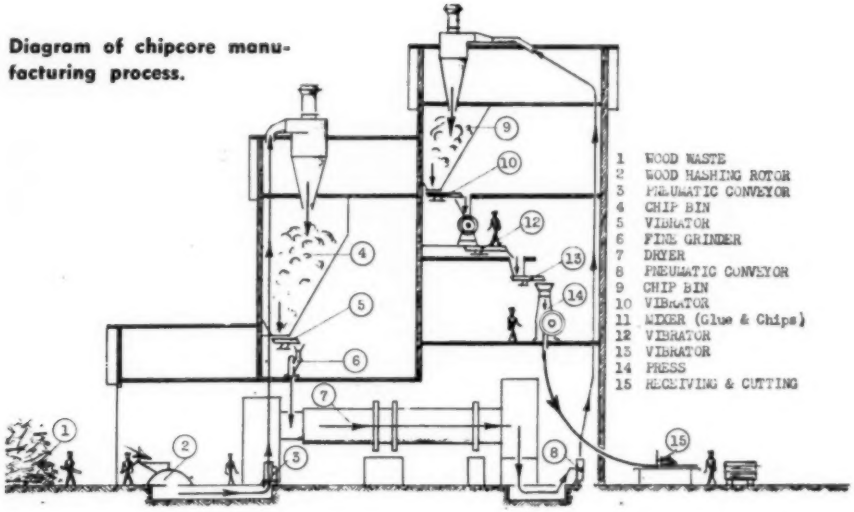


Diagram of chipcore manufacturing process.

in a continuous form. In Kreibaum process chipcore, therefore, there is virtually no swelling or shrinking in the thickness of the chipcore. This is a unique feature. The thickness is thus always uniform. Sometimes there is a tendency among many horizontal process chipcores to swell in thickness. The stability of this important dimension assures a top-grade finished plywood product.

Because of the vertically oriented chips, methods of fabricating this core material into plywood-type products differ in some respects from those woodworking methods used on other types of chipcores.

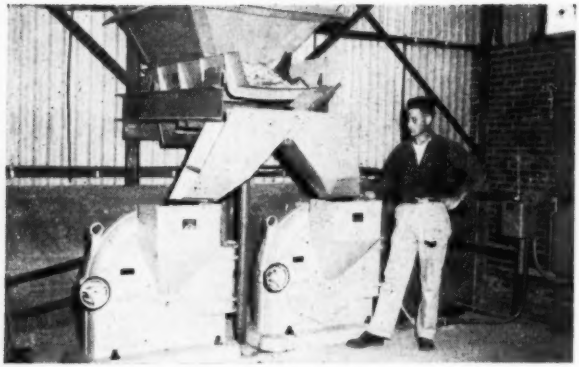
Another difference between horizontal and vertical process chipcore is that in the horizontal type process there is a tendency for the smaller chips to settle to the bottom, causing a problem in maintaining even-density cores. The Kreibaum vertical process assures absolutely even distribution of the larger and smaller chips.

Manufacturing Advantages

Two manufacturing benefits of this Kreibaum type of chipcore are (a) the low manpower required to operate a Kreibaum plant and (b) the small amount of plant space necessary to house the machinery.

Only seven men and a superintendent are required for each shift in a complete Kreibaum chipcore manufacturing plant, which includes two presses

Cordwood going to hog for conversion into chips. Any hardwood or softwood forest or factory waste—except sawdust—is suitable for use.



Milling machine which refines chips to most efficient size. Uniformity control of materials is essential to production of quality chipcore.

capable of extruding about 7000 square feet of chipcore in an 8-hour day.

It is, however, recommended that a Kreibaum plant run continuously like a paper mill. With three shifts, allowing for stoppages for such things as changing the thickness specifications, etc., the average plant will produce approximately 20,000 square feet per day.

To house the Kreibaum equipment, which is sold as a complete plant, only about 3,500 square feet of space are required for the 40' high pressing tower. If the extruded board is delivered right into a furniture factory or plywood plant, no additional space is necessary. In other cases a one story warehouse type building is normally required.

Kreibaum chipcore can be made of either hardwood or softwood, factory or forest waste, or a combination of the two. Green cordwood, lumber scrap or other forest or factory waste, except sawdust, can be used.

In cylindrical drier moisture content of green chips is reduced to precisely the right percent for greatest efficiency in chipcore.

Machinery Needed

The machinery for producing Kreibaum chipcore, and the manufacturing process, are as follows.

Chipper (hog): This machine reduces the raw wood waste or cordwood into rough chips. The rough chips are then moved by means of a blower into the green chip bin.

Fine Grinder (milling machine): The green chips are fed by a vibrator into a milling machine which refines the chips to the most efficient size. Uniform control of materials is essential to production of quality chipcore.

Drier: The refined green chips are then fed into the rotating drier, and heated air moving through the cylinder dries the chips to a pre-determined moisture content. The fan at the end of the drier also removes the fines or dust, created by the chipping operation.

Chip Mixer: The dried chips are taken from the dry chip bin in the third story

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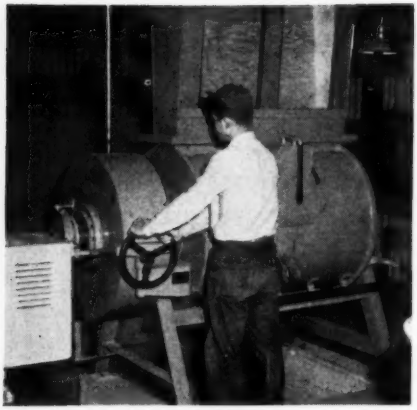


In mixer where glue and finished chips are combined in exactly pre-determined proportions preparatory to pressing into finished board.

of the tower, and fed by means of a vibrator into the chip mixer. At this time the proper glue formula is added.

Presses: The impregnated chips are then fed into the vertical press by means of a vibrator and the chips move down between the two heated plates which press it into the finished board. The core is cured by the high temperature maintained in the plates through a high-pressure hot water system. Each Kreibaum plant setup includes two presses fed from the same chip mixer.

As the core is extruded from the press, a traveling table saw cuts the panels to the customer's specified width. The press is so designed that a core of almost any desired thickness can be produced up to 2". However, a core-stock thicker than 11/16" is not recommended for solid chipcore. Tubular chipcore is not currently being made thinner than ⅞", and not thicker than 1⅛".

Working with Chipcore

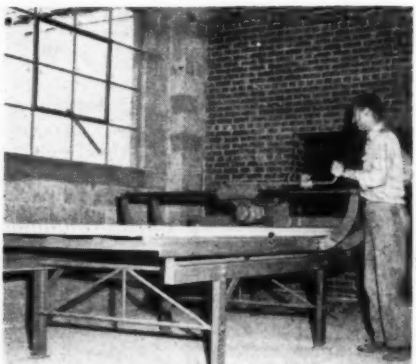
The Kreibaum process produces a chipcore designed for use as a core material in a veneered assembly. It is versatile in application and easy to work using the following methods.

The chips in the Dean Kreibaum chipcore are oriented in a vertical plane (unlike horizontal or batch processes) thereby assuring dimensional stability in thickness and in the 49" grain direction (length). Veneering at right angles to grain produces the stability in width. The chip sizes are evenly distributed throughout for flatness in the finished product.

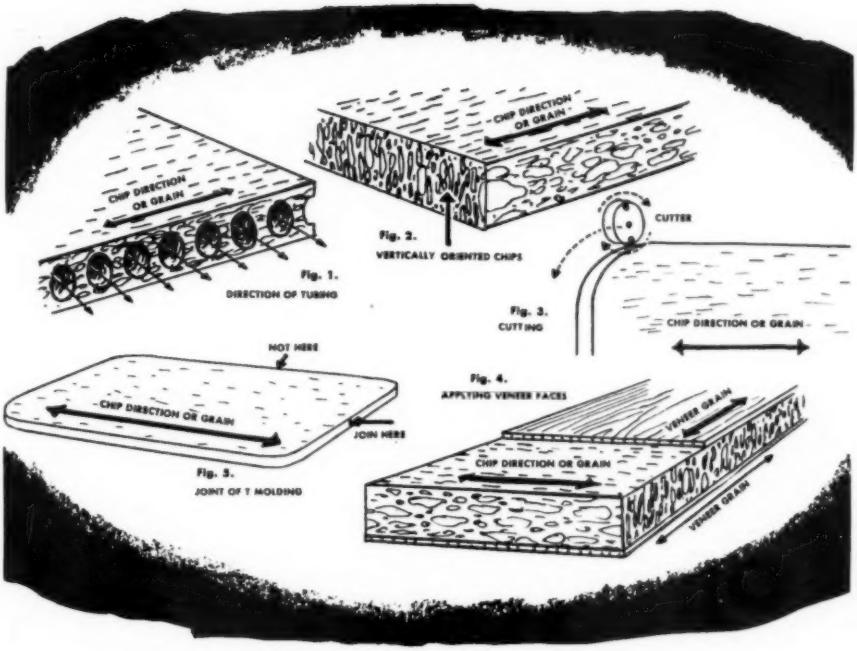
Size is only constant in the 49" grain direction, or length. However, since it is a continuous extruded panel board, it can be cut to any desired width.

Therefore, in actual use, the 4' dimension is the length of the panel when made up into 5-ply panels, as the cross-banding must be at right angles to the direction of the chips (Fig. 1). The Kreibaum core in 5-ply panels must be butt-jointed to achieve greater length than 49". This can be done very satisfactorily and is a comparatively simple process.

In making up 3-ply panels, of course, butt jointing the chipcore is not necessary as the face and the back veneers,



Tube-type Kreibaum chipcore at saw table after coming from press.



have the grain running the long way across the grain of the chipcore (Fig. 2). A 3-ply panel, therefore, can be any length without butt jointing the core.

Two Types—Solid and Tubular

There are two types of Kreibaum process chipcore to meet every need with maximum efficiency.

It is made in solid form in three thicknesses (see chart) to serve the same purpose as solid lumber core construction. Because good grades of lumber for good lumber core are growing scarcer, there is, therefore, a definite price advantage in using Kreibaum chipcore.

For thicker panels with lightweight, it is also offered in tube type boards in sizes up to 1⅞" thick making many new uses of plywood practical. The tube type has holes running at right angles to the grain direction. This type effects a definite saving in weight (approximately 1/3 less in some cases than solid chipcore of same thickness). There is also an important saving in cost—more than in the solid type chipcore.

Tubular chipcore, therefore, is ideal for thick furniture parts such as desk tops, furniture tops, dinettes, etc., and for such other uses as wall partitions.

Thicknesses in which Kreibaum process chipcore is now manufactured are shown in the chart.

Type	Nominal Thickness	Weight per M sq. ft.
½ Solid	0.515"	1800#
⅝ solid	0.650	2300
11/16 solid	0.715	2500
⅞ tubular	0.890	2350
1⅛ tubular	1.145	2950
1½ tubular	1.520	3200
1⅞ tubular	1.890	3500

Butt-Jointing Chipcore: Kreibaum chipcore can be butt jointed, then glued to make cores longer than 49". This can be done in Panel-Flo or similar equipment, or in cold clamps.

Lumber-Banding (Framing): If lumber is banded, it should be approximately 1/100" thinner than the Kreibaum chipcore. After chipcore has been lumber-banded, the whole assembly should be sanded or planed before further veneering of surfaces.

Veneer Edge-Banding: Glue veneer (1/16" recommended) with a cold or hot setting glue pressed to the edges in the conventional way. Kreibaum chipcore edges, of course, should first be sanded.

Sealing Kreibaum Chipcore: By applying a film of glue or liquid plastic with a brush, or pressure spray, or spreading in some other manner, it is possible to cover the pores of the chipcore and give a reasonably smooth surface. This would apply, of course, only where edges of chipcore were not lumber-banded or veneer edge-banded.

Metal-Banding: In the case of plastic table tops where edges of Kreibaum chipcore must be grooved to accommodate the conventional T-moldings and where the tongue of each such molding has to be affixed tightly into a groove cut into Kreibaum chipcore, it is recommended that the groove be cut sufficiently wide to avoid breakage. Carbide tipped cutterheads work best for this purpose. It is further recommended that the metal strip be joined on one of the two edges that run at right angles to the grain.

Planing and Surfacing: Kreibaum chipcore may be surfaced before veneering. However, due to its even thickness it may, for certain purposes, be used without surfacing in the same manner as rotary-cut thick veneers are used for cores in thinner panels. For finely finished products the chipcore should be surfaced before veneering.

Chipcore may be surfaced by planing. In so doing, feed in the grain direction when possible. Sizes too wide for the planer may be sanded across the grain —due to its even thickness, as little as 0.010" from each surface will usually be sufficient. After surfacing, stand the chipcore on edge so dust and loose particles will fall off.

Oftentimes, Kreibaum chipcore does not require sanding. If sanding is desired, any commercial drum or belt-type sander may be used. For best results—sand with the grain. Vertical sanding of edges may be done with a belt sander.

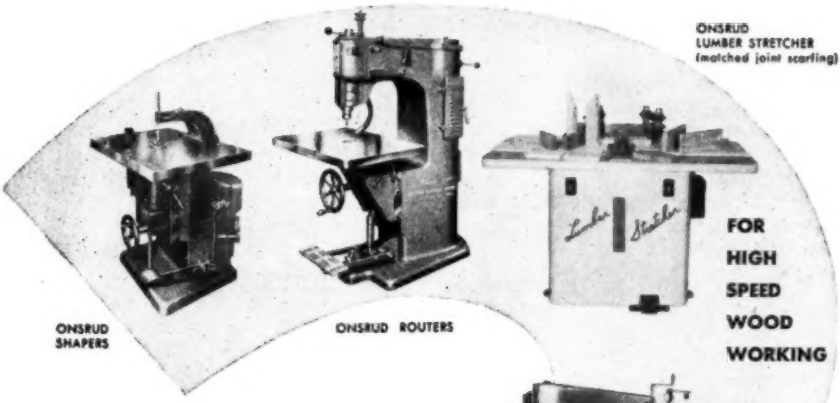
Veneering: Kreibaum chipcore is engineered for a core of a veneer sandwich or other built up assembly, not as a board to be used without covering. Its expansion or contraction is not in the thickness or length (49" core way) but only in the width (across the 49" grain) which is controlled by veneering.

Therefore the veneer on each side of the chipcore (face or back for a 3-ply panel or crossbands for a 5-ply planel) should have the grain direction running at right angles to the 49" core way.

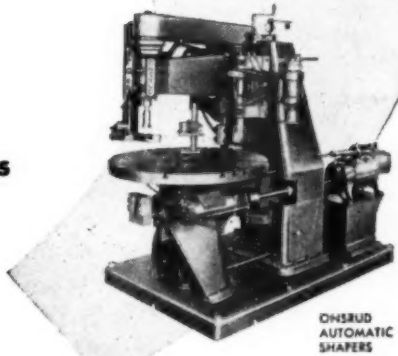
Where highly polished surfaces are desired or heavy stresses are involved, Kreibaum chipcore in conventional 5-ply construction (with 1/20" crossband and 1/28" face) is preferred.

In many cases, however, Kreibaum chipcore can be covered directly with face and back veneers in 3-ply construction.

In a 3-ply panel it is suggested that the face and back plies be of minimum thickness of 1/20" (0.050 for high density woods such as birch and hard maple; 1/16" (0.060) for medium density woods such as gum, Philippine mahogany and genuine mahogany; and



new tax laws make new machines cost less than old machine maintenance



Why keep old machines today . . . when new machines can cost so little? Depending upon your tax bracket and a few other variables . . . a new $10,000 machine might be yours after taxes at an *annual replacement cost* of as little as $125.00*. And this small amount is easily repaid in terms of better, lower cost new-machine production plus savings in maintenance.

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Apparently it's important to our government that America's plants be well equipped. The methods you can use with full approval of the Bureau of Internal Revenue to achieve such amazingly low annual replacement costs are known as the Declining Balance Method and the Sum-of-the-Digits Method of depreciation. Not only does this give you tremendous advantages in new machinery purchasing . . . but it often makes the maintenance of old machines actually cost you more.

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* see "Effect of the New Tax Law on Equipment Replacement", by William Meyers, Machinery magazine, October 1954 issue.

1/12" (0.080 for low density woods such as white pine and basswood.

In all cases, the grain of the veneer immediately adjacent to the Kreibaum chipcore must be at right angles to the grain of the chipcore. Both sides of the chipcore must be covered by veneers of equal thickness, of the same kind of wood if possible. This assures straight, flat panels.

If plastics or hardboards are applied, care must be exercised to make sure both covering layers have the same swelling and shrinking properties in order to avoid an unbalanced construction and consequent distortion of the panel.

To Glue Chipcore: The dimensional stability thickness-wise of Dean Kreibaum chipcore is occasioned by the fact that many of the chips stand on end perpendicular to the surface presenting end grain wood and therefore some precautions must be taken in gluing.

Feed the veneer, not the chipcore, through the glue spreader using about a 40 lb spread of a glue formula similar to this:

100 parts Urea Resin (65% solids)
50 parts Wheat Flour
15 parts Shell Flour
70 parts Water
Necessary Catalyst

In handling and gluing, treat the chipcore as you would thick rotary cut veneer centers.

Hot-Pressing Operation: For hot pressing, 125-150 lb. p.s.i. is suggested, depending on the density of the veneers involved, when using the solid type chipcore; 100 lb. p.s.i. is recommended for the tubular type. Heat of press should be 240° F.

Cold-Pressing Operation: For solid Kreibaum chipcore, 120 lb. p.s.i., press-

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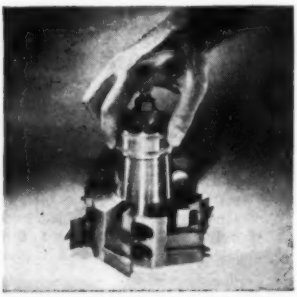
in cutter heads and planer knives



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Disston Philbrick® Cutter Heads have accurately ground center holes . . . are dynamically balanced and precision lapped to run without vibration and chatter. That means smoother operation, more accurately planed and shaped wood. Knife changes are quick and simple—no gibs, clamps or holders. Each pair of heads can work a variety of patterns.

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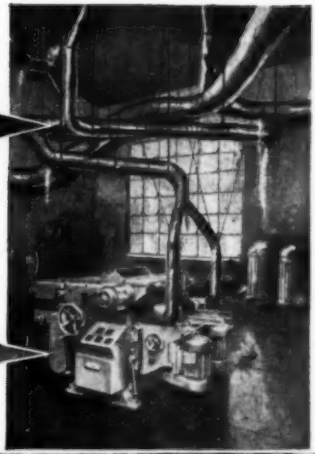

Much of the efficiency added by new equipment may be lost by an outmoded dust control system . . . match your new machinery with new or added capacity like this in your dust control system.

When you replace old, outmoded machinery with the newest in woodworking machinery . . . do you consider your dust control systems, which may well be tired, inefficient, overloaded or just badly designed?

Be sure that your dust collecting systems are not wasting substantial amounts of power, limiting production and handicapping operations in your plant.

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KIRK AND BLUM

DUST CONTROL SYSTEMS

ing time up to six hours. With longer pressing time, the pressure should not exceed 100 lb. p.s.i. When gluing tubular Kreibaum chipcore, a pressure of 70 lb. p.s.i. is recommended. To obtain perfect surfaces, metal cauls are to be used between each two panels to be glued.

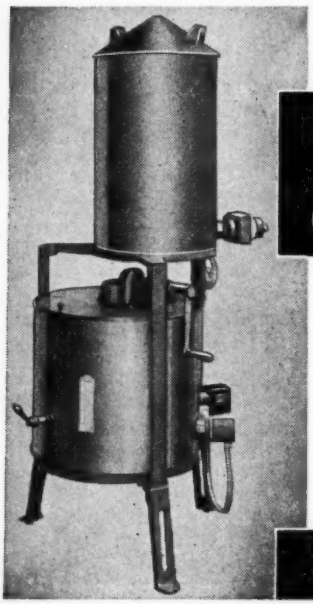
Sawing Chipcore: Although Kreibaum chipcore can be worked with normal woodworking machinery, it has been found that it is highly desirable, where possible, to use carbide tipped cutterheads or saws. A high r.p.m. is recommended.

For sharp corners, saw chipcore first at right angles to the grain and finally in the direction with the grain.

Shaping Chipcore: Certain basic forms, such as rounded corners, grooves, mitres and tongues, can be achieved in Kreibaum process chipcore with conventional cutting tools. To get the best results and a clean cut, the cutting direction of the tools and the feed must be the same (i.e., a cutterhead would be cutting away from the operator, not toward him).

If possible, cutting should be done on the edge of the chipcore which is parallel to the grain. It is further recommended, wherever possible, that pieces of chipcore be fed into the machine edge to edge in a continuous flow, rather than separately.

Screwing, Nailing, etc.: Kreibaum chipcore can be bored, nailed or screwed like other wood materials. Screws will hold firmly in chipcore, but should not be overdrawn or forced. In Kreibaum tube-type chipcore sometimes short dowels are inserted into holes in areas where screwing or nailing is to be done. This makes for better screw holding strength. Other techniques, such as inserting lumber pieces at corners, etc.,



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have been devised so that adequate screw holding can be achieved.

Further Research

Research, both in labs and in actual woodworking operations, is being conducted to further expand the possible uses of chipcore and the methods of working it. Research on Kreibaum chipcore has already been done in this country to supplement the knowledge gained in its eight years of successful application in Europe. The various plants now using Kreibaum process chipcore in America are pooling their knowledge as new techniques are developed.

For more detailed technical information, for answers to specific questions on woodworking methods or problems or to inquire as to how chipcore would fit into your special woodworking operation, write direct to The Dean Company, 666 Lake Shore Dr., Chicago, Ill.

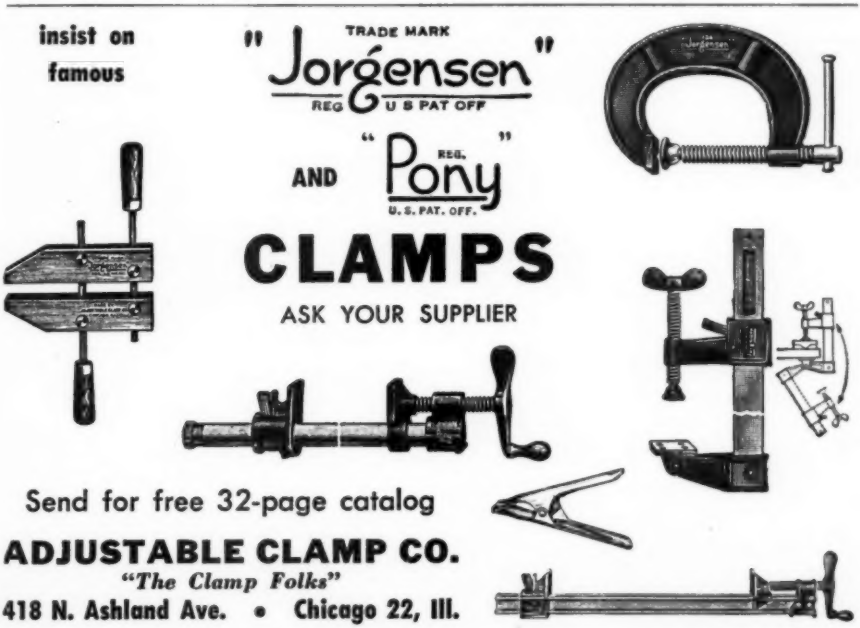
(To be continued).

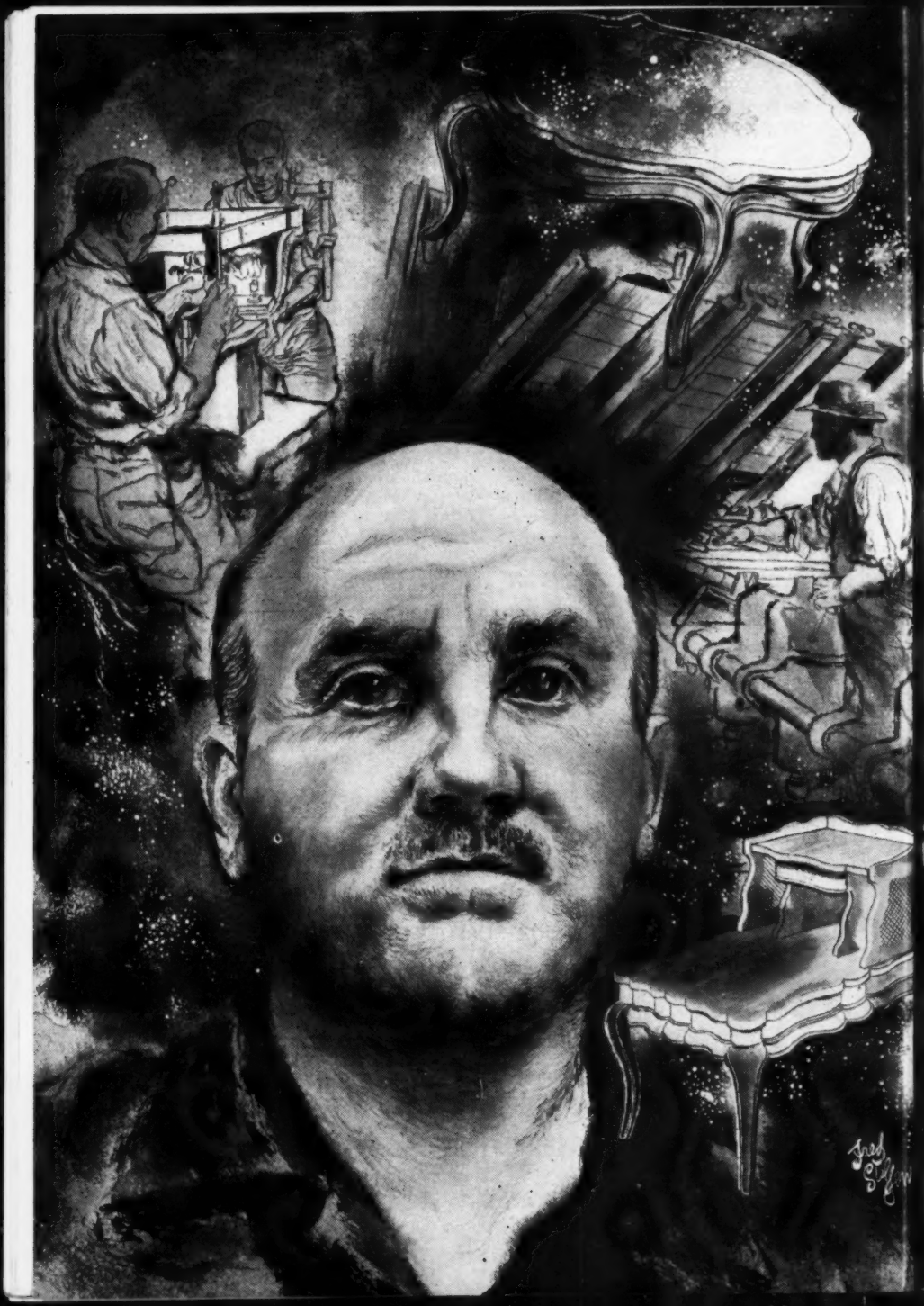
F.P.R.S. PROGRAM

A full program of technical discussions on the various processing methods of wood will fill three days at the ninth annual meeting of the Forest Products Research Society in Seattle, June 20-23.

Technical sessions have been scheduled Monday through Wednesday on the subjects of glues and gluing, wood drying, logging and milling, wood preservation, veneer and plywood, chemical utilization, marketing, wood finishing, composition boards, and wood machining. Special tours of various wood manufacturing plants in the Seattle area will be arranged on Monday and Wednesday afternoons.

A full day tour of the wood products manufacturing plants in Everett, Washington, is planned for the Thursday, final day of the convention. Special trips to other plants in Washington and Oregon will be arranged by the committee in charge of the convention for those delegates desiring to spend time in the Pacific Northwest following the convention.





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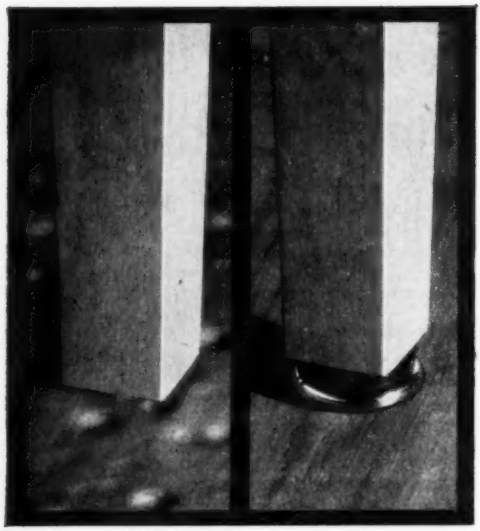

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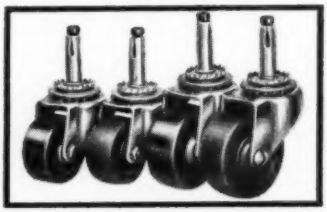

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Furniture Damages In Shipping

By R. E. L. Harmon,

Furniture Specialist, Freight Loss & Damage Prevention Section, Association of American Railroads, Chicago.

CLAIM payments for loss and damage to furniture in transit totaled $6,730,153 in 1953, as compared with $7,161,866 in 1952, a decrease of $431,713 or 6 percent.

One amazing fact regarding furniture damage is almost unbelievable, that is, rarely do you contact a shipper that has experienced trouble. Their statements are generally about as follows: "Our claims are negligible," "Practically nil" or "Less than ½ of 1 percent." These statements are made in all sincerity, but unfortunately claims are seldom filed by the shipper. Their knowledge of damage is generally based on demand for replacement parts and requests for original bills of lading.

Let us break this down as to actuality. Many types of damage would not require a replacement part nor would it reveal the articles rejected to the carrier for salvage. It is also true some consignees request the shipper to furnish original bills of lading but as a rule indemnity bonds are provided by them in lieu therof in support of claims. Therefore, most claims are presented without knowledge of the shipper.

In my experience, some shippers sincerely believe their customers would always inform them of excessive damage. A few do, of course, but most retailers in the prevailing buyer's market will purchase from another source rather than bother with transmittal of this information. I have dwelt considerably on this phase as I sincerely believe therein lies the possibility of prevention of recurrent damage—knowledge of its existence followed by corrective action.

The articles most often involved in recurrent damage are related to volume of the articles produced and shipped, case goods, tables and chairs heading this list with no one article being immune to damage. More than 90 percent of furniture damage is allocated to unlocated causes or concealed in nature. Determination of cause is most important for prevention to function. Ideal, of course would be the ability to conduct a post mortem on each damage. With few exceptions, however, carload traffic is neither loaded nor unloaded by the railroads, and therefore, that responsibility rests with shippers and receivers. Because so relatively few shipments are inspected by the railroad before unloading, if the consignee fails to report the cause accurately, avoidable damage may be repeated over and over again.

Likewise most articles involved in a concealed damage are unpacked prior to inspection by the railroad representative. Consequently, our damage is qualified as to nature and extent but invariably not as to cause. Our education of damage inspectors is progressing to an extent whereby they are originating much information of preventive

Much of furniture damage is recurrent and because of this is within means of control for prevention. While manhandling is a contributing factor to damage it is not the major cause as frequently attributed. Proper analysis of damage experienced together with examination of characteristics of articles and application of inner packing invariably provides the opportunity for corrective action at the source of manufacture and packing.

value regarding extensive or repeater damage.

We all know an article properly and adequately packaged at the source has been started a long way toward safe delivery. Packaging specifications of the freight classification are minimum requirements with the majority of individual packages providing alternative methods of packaging. Many manufacturers exceed these requirements in providing additional inner packing to further insure safe delivery of their products. Packaging compliance and adherence to basic packaging principles have a major bearing on performance. Equally important is active supervision of packaging forces and proper handling of articles from production to packing room.

It should be borne in mind that the following causes of damage are not always positive, that is, all our damage cannot be charged to these reasons, but prevention has been accomplished frequently enough on these analyses for it to warrant consideration.

Crated Furniture

Crated articles in Pkg. 5-F must conform to construction assembly, lumber dimension, specified clearances, and suspension. Recurrent types of damage to articles in this package generally consist of chafing of upholstery, finish abrasion or breakage of parts. Invariably this is due to inadequate blocking, bracing or suspension, allowing the article to move within the container.

Frequently, suspension members are placed lengthwise when crosswise placement would provide more substantial support for the article. Further, end nailing into suspension members is not good practice.

Damage has also been experienced with crated articles that are suspended with heavy unsupported weight causing splitting or breaking of the hanging portion at points of attachment to top. Solution: Subsupport or additional suspension.

Pressure Pack Method

Top Corners and Edges

Damage: Bruising, splitting or breakage of these parts.

Cause: Inadequate or improper protection. Blanket materials of insufficient size to fully protect finished surfaces, selvedge edge of some types in some instances affording the only protection for these vulnerable portions.

Correction: Application of blanketing materials to obtain double thickness around perimeter of top through overlapping of body and top blankets. Certain styles with overhanging tops or with extremely square edges or corners required use of double faced corrugated fiberboard corner forms.

Legs or Flush Bases

Damage: Splitting, chipping or breaking.

Causes: Improper positioning of wooden base frame members or too narrow dimension of frame cross pieces affording inadequate mounting. Splitting of legs or bases due to attachment to wooden frame.

Correction: Proper assembly and dimension of wooden base frame according to style of case. It has been our experience that legs or bases of case goods resting or floating on wooden base frame is much more desirable since shocks to base of container cannot be transmitted directly to article at point of attachment.

Sliding Glass Doors

Damage: Chippage or breakage of glass positioned in running tracks, splitting of case end panels.

Cause: Existing track tolerance too great creating excessive movement in transit and jumping out of track; insecure blocking developing lengthwise play; impacts in transit against end panels splitting them at dowel attachment.

Correction: Best method is to wrap glass doors in fiberboard wrapper and position against back of case.

Hinge Doors

Damage: Splitting of hinge rail, bending or loosening of hinges.

Cause: Inadequate securement of doors.

Correction: Friction type catches require proper alignment to hold doors. Bullet type catches generally provide positive positioning. Doors fitted with locks should be fastened. Our experience with magnetic type catches will have to be extended.

Finish Abrasion and Press Marking

Damage: Excessive rubbing or marking of finish at various points.

Cause: Insufficient blanket coverage, article packaged with finish still warm from buffing operation.

Correction: Proper application of blankets or selection of material compatible with type of finish.

Drawers

Damage: Divider partition or end panels broken or split. Finish abrasion of post.

Cause: Partition or end panels have been damaged by placement within the drawers of loose bundles of detached legs or hardware. Unsecured drawers with faces in contact with posts, vibration causing abrasion of finish.

Correction: Securement of bundles of parts within drawers to eliminate sliding impacts against partitions or end panels. Fastening of drawers in position to minimize vibration, particularly desirable when drawers are of recessed type or when faces of drawers are flush with each other.

Racking of Case Frame

Damage: Loosening of case frame members especially at points of dowel attachment or glued blocks. Also split-

"You've a persuasive argument there, Hendrix—I'm afraid I'll have to approve your proposal."

ting or breaking of various structural members.

Cause: Insufficient application of adhesive. Articles with excessive base span without packaging reinforcement.

Correction: Proper application of adhesive and reinforcement of base span either with artificial legs under structural uprights in center of placement of blocking of sufficient thickness near center to compensate the blocking or legs at end panels.

Mirrors

Damage: Chippage or breakage.

Cause: Pressure exerted by fastening of clips or rosettes, inadequate forms failing to provide positive positioning and definite clearance.

Correction: Removal of clips or rosettes, positive maintenance of position and clearance with adequate forms.

Tables, Wooden, Set Up-Novelty Pieces

The extreme variety of styles and designs of this type of furniture presents many problems in that most of the packages authorized provide alternative methods of inner packing. Actually this choice of packing method by the manufacturer is based on knowledge of style and construction involved, his experience dictating those articles with styles of such nature that automatically require suspension.

Legs and Stretchers

Damage: Bruising, denting, chippage,

Cause: Legs mounted on improper wooden frame or suspension on inadequate forms.

Correction: Frame assembly insuring adequate positioning of legs, suspension forms of such design to bear weight and maintain necessary clearance.

Tops and Corners

Damage: Bruising, denting, chippage, splitting and breakage.

Cause: Poor assembly of clearance

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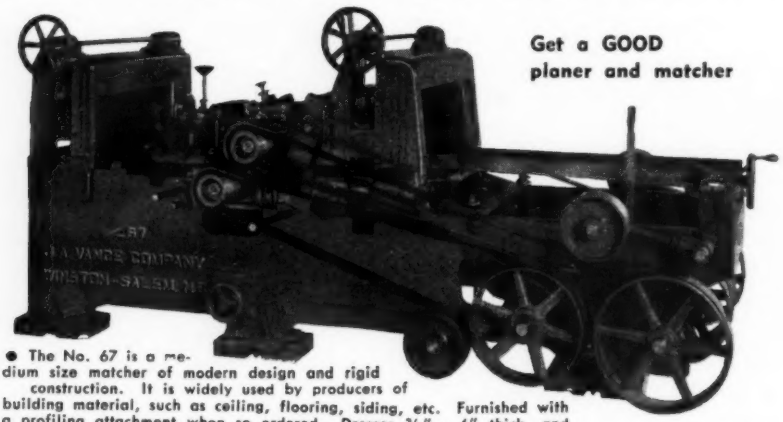

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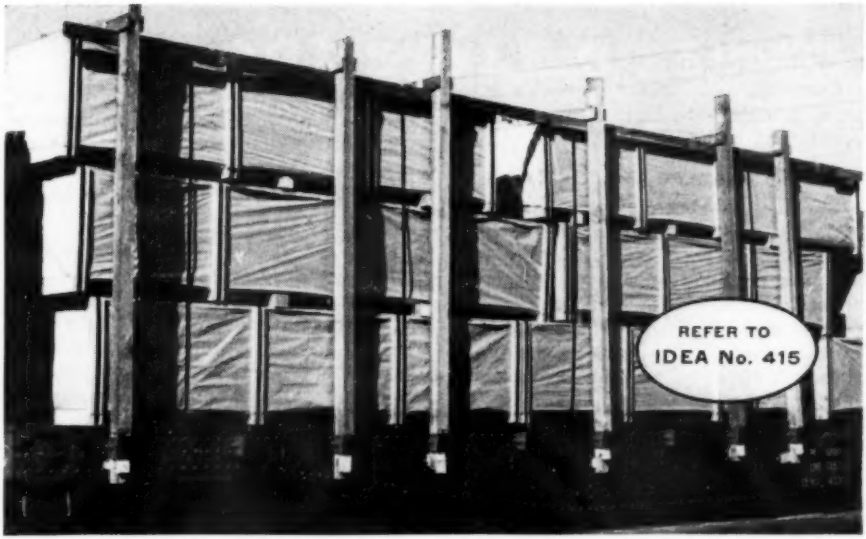

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ACME STEEL

forms or selection of inadequate material for characteristics of design.

Correction: Adequate forms or material to maintain proper clearances and positioning of article.

General Damage to Wooden Tables

Damage has been experienced with certain styles of tables packaged in a suspension manner, either metal-strapped method under top or suspended on structural frame in which suspended weight is hanging like a pendulum, causing splitting of these portions at point of attachment to top. Correction accomplished through provision of additional support or sub-suspension.

Wooden Chairs and Davenports

There are many types of packages authorized for these articles with a wide variance in packing specifications and numerous alternative methods depending on extent of upholstery, legs with or without stretchers, overstuffed and period styles and those of conventional design.

Each style has its particular characteristics with the package performance closely related to the packing method employed; therefore it is impractical at this time to cover other than damage in general.

Breakage of legs and chafing of upholstery are recurrent in nearly all packing methods and involve most styles of chairs and davenports. Cause frequently has been improper application of packing pads over vulnerable upholstered or finished portions, especially top of back rests and arm rests. Legs require careful consideration of style and construction to obtain the most effective method of protection.

Other Articles

Many of the other articles of furniture possess characteristics similar to those previously discussed and en-

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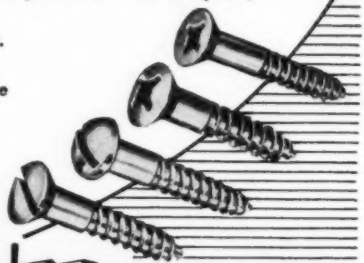

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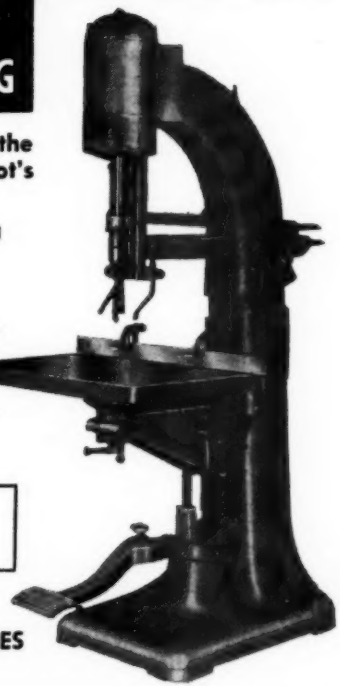

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MORTISES ALSO!

B. M. ROOT CO. | **YORK, PA.**

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counter damage of a like nature. Actually, packaging of furniture is relatively simple, most articles requiring a container, interior packing providing clearances or application of pad or blanket material, and base or leg protection. Package performance is dependent on analysis of construction and design of furniture to determine if article can carry the container or the container carry the article or if combinations of these two methods are required.

To emphasize again, much of furniture damage is recurrent and thereby within means of control for prevention through, first, knowledge of its existence and, second, thorough analysis as to cause followed by corrective action. Safe delivery of articles shipped pays dividends to us all.

READ WHAT THEY'RE SAYING ABOUT

Standard

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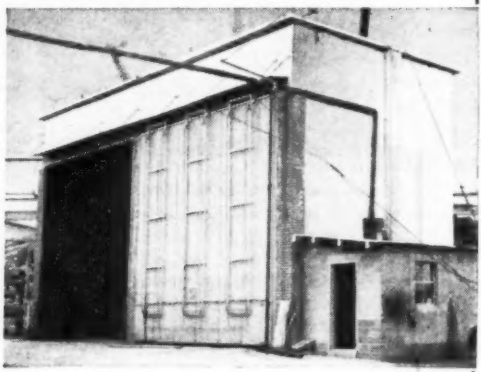

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Writes: "We are glad to report that we have had very satisfactory service from our STANDARD package kilns. So much so that we are now ordering a third and larger kiln from you. In the 3½ years we have used STANDARD kilns, we have kiln dried a great deal of expensive lumber such as Walnut, rift Oak, quartered Oak, Honduras Mahogany, African Mahogany, Cherry, etc. We can truthfully say we have had no difficulties whatsoever and we have received no complaints from any of our customers concerning lumber dried in these kilns. That in itself should tell the story."

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STANDARD DRY KILN COMPANY

P.O. BOX 5708 INDIANAPOLIS 21, INDIANA

BRANCH OFFICE: Redman Engineering Service • High Point, N. C.

Evolution of LUMBER DRYING TECHNIQUES and DRY KILNS

Part 16

By Paul H. Graham

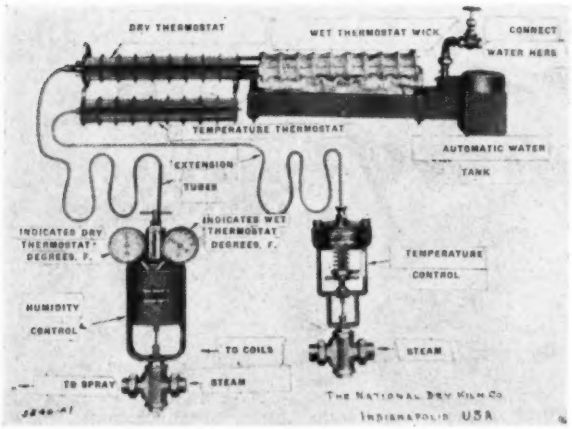
ANOTHER type of automatic recording instrument developed to record relative humidity graphically on a chart had its humidity pen operating from a hygroscopic element, consisting of a sensitized wood-fiber membrane wound in the form of a helix. Changes in relative humidity caused a deformation in this hygroscopic element with a consequent rotation about its axis. The torque developed permitted the element to operate the pen arm through a linkage to record relative humidity of the air surrounding the instrument automatically.

The chart drive mechanism of the early recording wet-and-dry-bulb thermometers required winding. Later developments brought out both spring-propelled and electrically-driven types. The spring-propelled drive was generally used in areas where alternate current of constant frequency was not available. The drive movement was usually equipped with fast or slow adjustment easily accessible through the chart plate. Where alternate current of regulated frequency was available, the electric drive was generally preferred as it eliminated requirement of winding and except for infrequent power failure, ran continuously without requiring any attention other than pen care. The drives themselves were usually some form of mechanical drive mechanism or synchronous motor.

Recording thermometers were used for kiln work up to the early 1920's, with control of kiln temperature and humidity being obtained by manual operation of valves in an attempt to compensate the differential between temperature and relative humidity obtained and that required. The kiln operator was forced to manipulate his valves constantly and most carefully to anywhere near hold a constant temperature.

While the introduction of reducing valves and steam pressure regulators were of some help, it was practically impossible to maintain uniform drying conditions, due to fluctuations of outside atmospheric conditions. Hunting—override or underride of the desired temperature—was a common fault and many charts were seen bearing telltale saw-tooth curves indicating poor kiln performance.

The first development used to combat this troublesome temperature variation was the automatic temperature controls. Humidity controls came late. Wet-bulb temperatures were considered to be fairly uniform in most kilns so the problem of obtaining uniform drying conditions was thought to be chiefly a



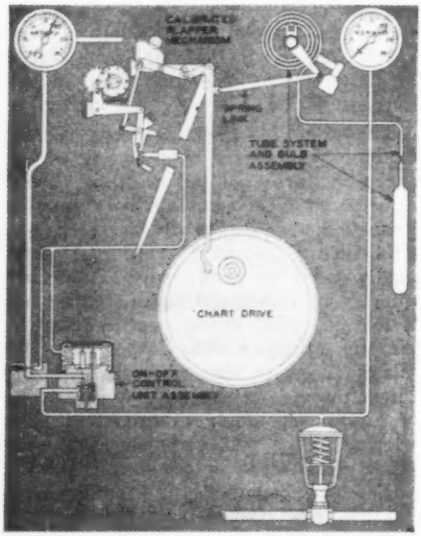
Humidity and temperature regulators of an early type National dry kiln.

matter of maintaining uniform dry-bulb temperatures.

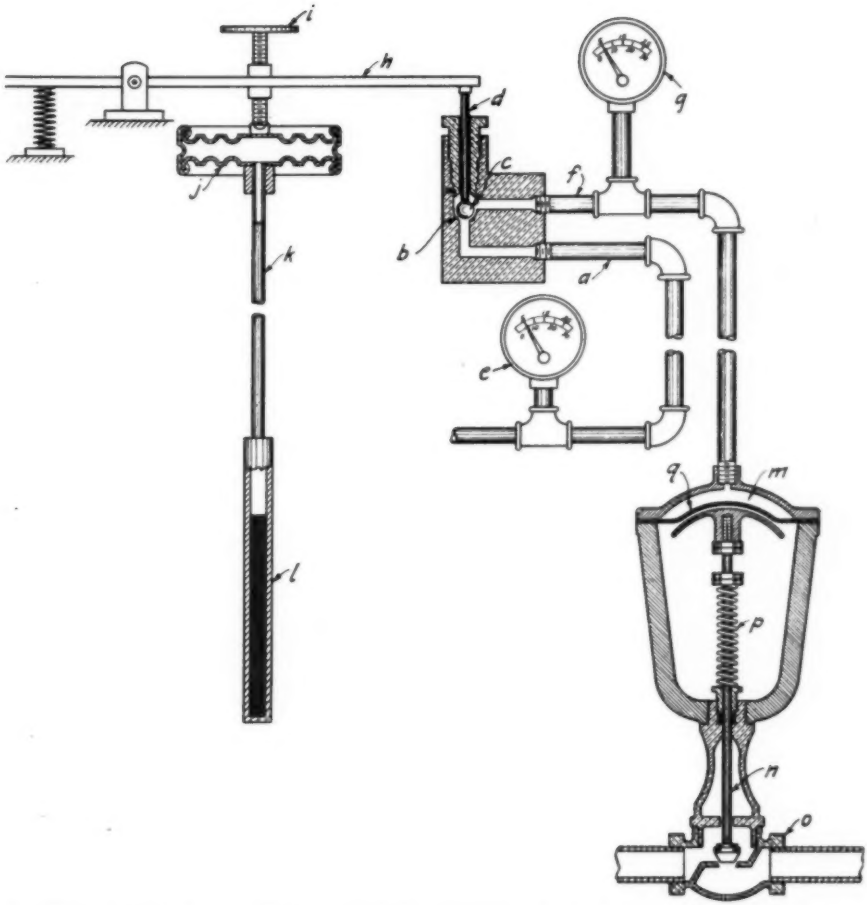
Automatic temperature controls were of two major types—self-contained and auxiliary-operated controllers. The self-contained type had the advantage of lower initial cost of installation, as no auxiliary power was required for its operation, but it was generally less sensitive and efficient than the auxiliary-operated type, especially where kiln drying conditions required wide fluctuations of steam. While the auxiliary-operated controller used an outside source of power for operation, principally compressed air, it responded more quickly to changes in temperature and controlled with a variation as low as 1 degree in kiln operation.

In a typical self-contained automatic control instrument operation was by transmission of pressure inside of the bulb in the kiln through a capillary tube to a diaphragm in the motor head of the valve. Expansion of the diaphragm activated the stem of the valve in the steam line. This movement was directly opposed by constant counter-pressure provided by a sliding weight or an adjustable spring. The only adjustment required to operate the controller on a desired temperature was to change the position of the weight or to adjust the tension of the spring.

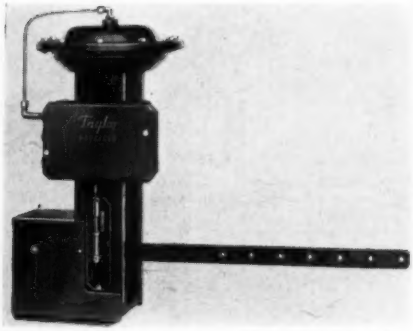
In the weight-type controller lever adjustment for various temperatures was secured by a movable weight. To raise the temperature limit, the weight was moved out on the lever. To lower the temperature limit, the weight was



Direct operating mechanism of Tag recorder-controller.



Auxiliary-operated controller powered by compressed air operates when air is admitted to chamber m. It forces downward diaphragm q and with it valve and valve stem n. Valve seated in valve body o, shuts off flow of steam. When air pressure is released, spring p, aided by steam pressure acting on underside of valves, raises valve, thus opening steam passage. Supply of air to diaphragm motor is controlled by small valve c: when temperature of bulb 1, inside kiln, rises with increase in temperature, increased pressure is transmitted through capillary extension tube k to spring capsule j. This expands to raise top, carrying with it adjusting screw i and lever h. Movement allows air pressure from supply line a to raise valve c and valve stem d. Air then flows around valve, through pipe f, into chamber m. When temperature of bulb 1 falls, reverse action takes place and valve c is seated, shutting off air supply to diaphragm motor valve. Pressure of air in chamber m then relieved through leakage of air around valve stem d, made to fit loosely for this purpose. Valve and valve stem n rise when pressure is relieved. Gage e indicates pressure of air supply; gage g that acting on diaphragm q.



Taylor lever motor used in connection with wet-bulb side of controller produces thrusting movement to manipulate vent dampers.

moved closer to the regulator. The weight was secured in final position by means of a thumb screw when proper adjustment had been made.

The spring-type controller was adjusted by means of a compression spring. To raise the temperature, the adjusting nut was turned up to compress the spring. To lower temperature, the nut was turned in the opposite direction to decrease spring tension.

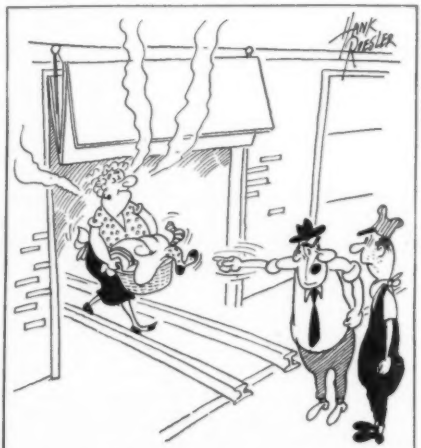
Auxiliary-operated controllers using compressed air for their operation usually had the diaphragm connected to the flexible spring capsule through an armored capillary tube. Changes in temperature of the bulb in the kiln were reflected by changes in pressure of the filling material in the bulb which caused the spring capsule to expand or contract to move a pivoted lever which opened or closed a small air valve in the regulator. Compressed air at 15 to 25 pounds pressure was admitted to the system and was passed to the motor head to close the diaphragm valve on the steam line.

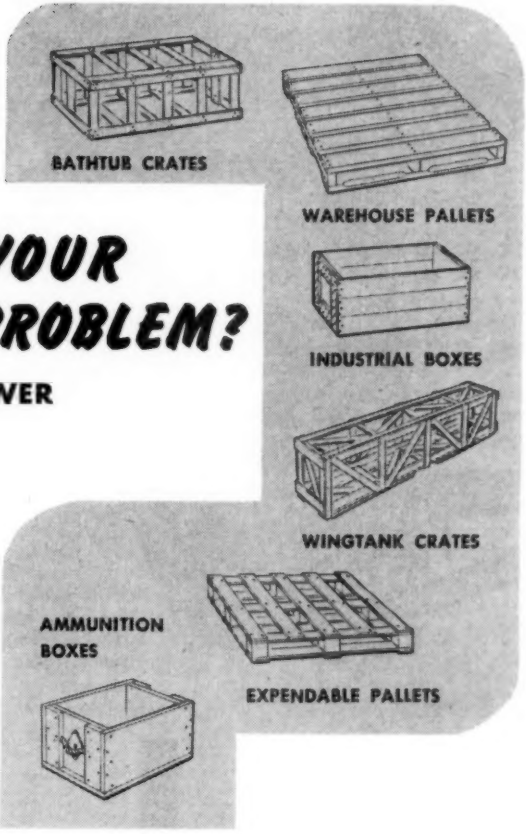
Closing the air valve shut off the air supply to the diaphragm. Means were provided for relieving pressure by leakage or escape of air in the valve head, and the steam valve was opened by spring action to let steam into the kiln.

Reverse-action valves were installed with many of these control instruments which were designed to close the steam valve when there was failure of air supply, to prevent excessive rise in temperature. Similar protective measures were afforded where direct acting valves were used by means of placing a reverse acting valve on the main steam line and connecting it directly to the air supply.

The following description provided by a manufacturer of a commercial dry kiln using auxiliary-operated controls for both wet-and-dry-bulbs serves to illlustrate the operating principle of these controls:

"Wet and dry bulb controls are reverse acting air-operated regulators and control valves. Regulators require a source of clean dry compressed air. When bulb in air stream calls for more heat, regulator opens air valve and compressed air is fed to top of diaphragm of control valve. The compressed air





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Many of the problems of industrial nailing which are troublesome to you today, may have already been successfully studied and solved by FMC nailing machine design and application engineers.

Problems arising from countless combinations of woods, materials, nailing patterns, speeds, space, manpower, pressures, feeds, mechanics, hydraulics and other variables have been resolved by our engineering department. From hundreds of case histories FMC can counsel with you on all phases of automatic nailing.

Hand us your nailing problem. We believe we can give you a successful FMC answer to it from the scores of types, sizes and models of FMC nailing machines which have been built and are in successful operation by firms like yourself—who once also had a nailing problem!

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NM-155

WRITE, giving us full details —or request Bulletin.

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Also available in 6-Inch Model.
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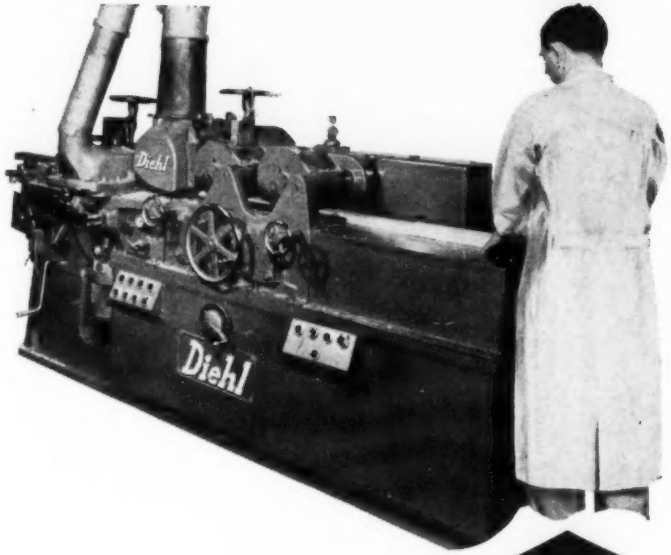
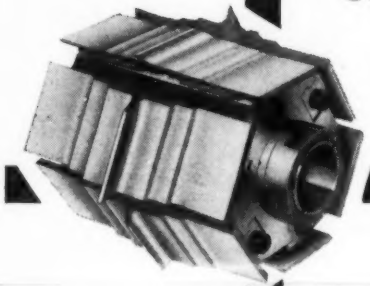


Combine Diehl balanced Cutterheads with the new Diehl Moulder . . .



Diehl Cutterheads . . .
your best investment for any moulder or jointer equipment.
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Diehl Cutterheads . . .
your best investment for any moulder or jointer equipment.
Write for Bulletin No. 452.

for balanced performance

An important fact . . . important to you in terms of plant output and plant profit: Diehl Cutterheads and Diehl Moulders are *designed together to work together.*

The advantages are obvious. From the design and engineering staffs of *one* company, you get a Cutterhead and Moulder combination built for *balanced performance.*

Diehl Cutterheads provide the truest, longest-wearing edges available. They are heat-treated by the latest methods. They are balanced to an absolute degree, both statically and dynamically. Their profiles are held to precision accuracy, through an optical comparator. And they are *available*—in either standard or custom design—with *expert* assistance from Diehl Cutterhead Specialists.

And for high-speed set-up and adjustment time, vibrationless operation, and permanent accuracy . . . the massive, streamlined, new Diehl Moulders are the standard of the woodworking industry.

For complete information on Diehl Cutterheads and the new Diehl Moulder, contact your Diehl Representative. He'll show you *why* this great combination has the *edge* in profitable production.

CUTTER DIVISION

Diehl

THE G. M. DIEHL MACHINE WORKS, INC.
Wabash, Indiana, U. S. A.

Standard of Comparison of the Woodworking Industry

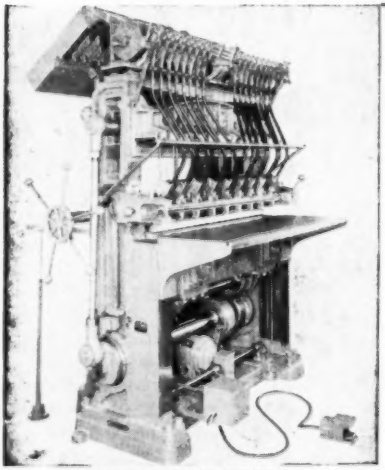
slowly opens control valve on main steam line to feed steam to heating coils. In case of air failure, valves are closed automatically by spring return on side of diaphragm oppcsite to compressed air inlet.

"Humidity in kiln is controlled by wet bulb reverse acting regulator connected to a reverse acting control valve on the steaming line. Steaming line consists of perforated pipe running the length of the kiln which feeds steam into kiln if humidity drops below required level. Since this is a reverse acting valve and regulator, air pressure opens the valve and spring pressure closes the valve. In case of air pressure failure, valve is closed by spring to prevent kiln from overheating."

Most commercial dry kiln companies converted to recorder controllers which combined a control element and a recorder. This automatic control not only recorded temperatures obtained in the kiln but also actuated a main steam valve to provide the desired kiln temperature and a secondary valve to provide the proper humidity. They were generally operated with an air-operated master valve or an electrically-controlled valve, where compressed air was not available or was not deemed desirable.

Even gas and oil-fired furnace type kilns used air-operated temperature and humidity controllers as basic control. Diaphragm type gas and water valves were used in place of the usual steam valves. Completely automatic controls reversed the dampers in accordance with time set on a clock and exhaust stacks and humidity equipment were controlled by a wet-bulb controller to maintain the desired relative humidity in the kiln.

The use of air-operated control for automatic regulation of ventilation was soon incorporated by most kiln systems.



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THOUSANDS OF PROBLEMS HAVE BEEN SOLVED BY

DOIG AUTOMATIC NAILERS

Standard Doig Features

1. Anti-friction bearings.
2. Three separate motorized drives.
3. Nail feeder to handle nails from 1 to 3 inches without additional parts required.
4. Nail feeders to give 12 separate nailing combinations.

NEW FEATURES

A. Wheel on left allows operator to adjust back gage from operating position.
B. Solenoid trip permits operator to trip machine at any position desired.

WRITE TODAY. WE INVITE YOUR REQUESTS FOR FULL DETAILS

WILLIAM S. DOIG Inc.

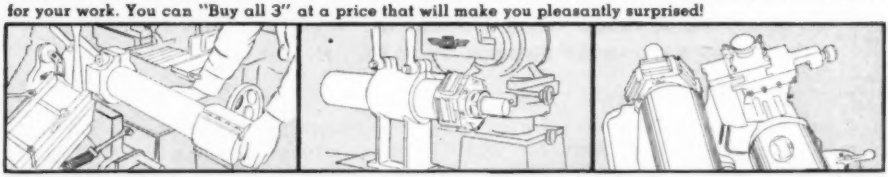
DEPT. 312 — 894 MANHATTAN AVE., BROOKLYN 22, NEW YORK

Compressed air was taken off from the wet bulb side of the controller which operated the steam spray line to operate a diaphragm lever attached to vent damper rods. Operation was just opposite that of the wet-bulb control. When the kiln air exceeded the wet-bulb temperature setting, the controller reduced or shut off the steam supply and simultaneously opened the vent dampers. When wet-bulb temperature was reached by reduction of humidity, the controller closed the vent dampers and opened the steam valves. This provided automatic control of ventilation in proper proportion to kiln drying requirements practically unaffected by outside atmospheric conditions.

Imagination is something that sits up with the wife when hubby is out late.

YOU NEED ALL 3 TO SAVE MOULDER PRODUCTION TIME...

Why all three? Because you can preplan, presharpen and prejoint the cutters for your next moulding run without tying up machine production time. In a matter of fifteen minutes, you can switch a complete set of cartridge spindles, with all cutters jointed on the bearings they are to run on! With the Dependable "Production Team" of all three machines, cutter maintenance is not accomplished at the expense of production time — and production time, of course, is profit producing time! Where else can you get a Moulder production package that gives you a cutterhead grinder; a precision jointing machine for jointing cutters on the operating spindles; and a heavy production Moulder with 5000 RPM Spindles using standard motors, all ball and roller bearing construction, variable feed drive, and with hopper feed, if desired, for feeding short stock? The whole "package" is designed to save you set-up time; give you precision, jointed work; and you can run spindles and feed at precisely the ideal speed for your work. You can "Buy all 3" at a price that will make you pleasantly surprised!



See how easily the cartridge spindle unit, with head and cutters intact, can be slipped in and out for sharpening or for changes in set-up!

Note that cutters are sharpened with the cutterhead remaining on the operating spindle, using a rigid adaptor on the cutterhead grinder.

Finally, jointing is accomplished with the cutters mounted on the bearings and running at the same speed as regular production.

Dependable MACHINE COMPANY

WOODWORKING MACHINERY

GREENSBORO, NO. CAR., U.S.A.

Pacific Northwest

Success Story . . . Biles - Coleman

By A. C. Klotz

District Manager, American Forest Products Industries, Tacoma, Wash.

THREE years after Biles-Coleman Lumber Company of Omak, Washington was founded, the pattern was set for its present place among woodworking plants in the Pacific Northwest. In 1924 its founder, J. C. Biles, made the decision to develop an integrated woodworking plant remanufacturing the entire cut of its sawmill operation. Today only a token amount of the total cut, 5%, is sold locally as lumber.

What does it take to keep a 700-man woodworking plant going?

It Takes A Lot of Timber

In 1940, after years of study, the timber growing potential of the economically feasible forestland tributary to the manufacturing facilities was closely estimated and Biles-Coleman Lumber Company began operating on a sustained yield plan. Federal agencies apportioned out timber on an annual basis designated to perpetuate the operation and thereby the community's prosperity. The company has adhered to the plan all the way through.

Not content to remain solely dependent on government timber, Biles-Coleman Lumber Company was one of the pioneers in the region in developing an industrial tree farm. Over 50,000 acres of its own lands are certified as a western pine tree farm. Three graduate foresters are employed to manage and develop this tract.

Still not content to sit back and just do a good job of turning out good, salable products with available commercially-usable timber, the company began studying the potentials inherent in the large stands of Lodgepole pine interspersing the commercial forests of the area. With notable success the company has converted Lodgepole pine from a weed species to the status of associated species contributing its share to the payroll of the Okanogan valley.

Emmit R. Aston, head of the forestry department.

It Takes A Variety Of Products

Ninety-five percent of the lumber cut in the sawmill department is reprocessed through the factory. This breaks down roughly to 18% in window, door and cellar frames, moldings and trim for the building industry; 31% as furniture cut stock, shelving, drawing boards, core stock; 46%, the lower grade of logs, goes into containers of various kinds. Annual shipment of all wood products accounts for 35 to 40 million board feet of sawlogs.

Sales manager Andy Aston reports products are shipped to 32 states and the District of Columbia.

Biles-Coleman Lumber Company of Omak, Washington . . . sawmill in the foreground; dry kilns to the middle left; woodworking plant, box factory and shipping sheds in the background.

Andy is particularly fond of the fine paneling made from Lodgepole pine. However, he said, somewhat wryly, that Joe Evans of Evans Lumber Company, Buffalo, N.Y. and "top paneling expert of the United States" prefers western-grown Ponderosa pine paneling both for its slow growth and especially for the amount of character in its knots. He thinks Lodgepole has too uniform a knot size. "It lacks the ovals, oblongs, branch knots."

It Takes A Lot Of Machinery

A mere listing of major equipment at Biles-Coleman Lumber Company reads like the advertising index of WOOD WORKING DIGEST: Yates-American planers and molders, Woods matcher, Greenlee double surfacers and equalizers, Challoner tenoners, Muskegon Lindermans, Morgan nailing machines, Mattison lathes, Whitney shapers, Onsrud router, Yales electric lift trucks, Mereen-Johnson tumblers and a Diehl matcher.

But one of the most important pieces of equipment is the Mann-Russell electronic edge gluing machine. The first of its size made by the manufacturer, this unit is the core of many of the production schedules in the plant. Handling lumber in any width and in thickness from 7/16" to 5/4", up to 6' in length plus trim, the unit turns out a continuous panel which is automatically ripped to any desired width at a speed of up to 16 f.p.m.

Main distinctive feature of the Lodgepole pine cut-up department is a horizontal band resaw with parallel feed tracks splitting the log at left and making 4/4 boards at right. The log pond is heated in the winter, hence the steam.

Laying up two rows of boards on Mann-Russell continuous electronic gluing machine.

As many as four rows of short length stock are handled at one time, although it generally requires a man for each row being fed, to keep up with the machine. Biles-Coleman Lumber Company is making as many as 35 panel changes per 9 hours of operation.

The built-in glue spreader controls the spread to reduce the amount of squeeze-out, thereby saving on glue cost. On a one inch board there are five or six separate streamers of glue. Standard urea formulations are being primarily used at Omak (Borden's Casco) although waterproof resins are just as usable.

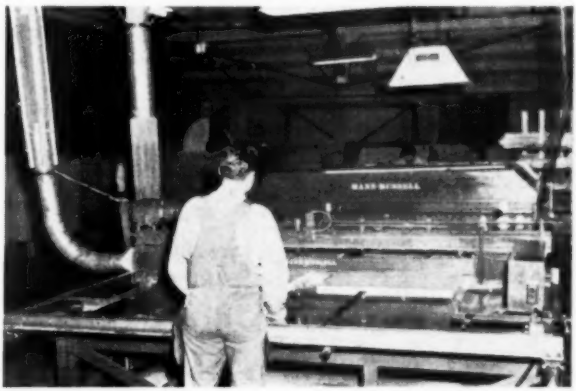
This piece of equipment hasn't been used on hardwood, but it works fine on all softwoods tested to date reports the manufacturer. Accurate machining of lumber is highly important in electronic gluing. Unless the lumber stock has good quality jointing, the glue froths in the voids with consequent slight holding power.

It Takes A Lot Of Know-How

Ask 31-year man Ed Kohls what one should first consider were one to plan a similar size woodworking operation from scratch and you get the same complaint any housewife will make.

"You always need more space."

Lifting his cap and rubbing his head while starting about his "pin-up" de-



Out-feed end of Mann-Russell electronic gluer showing continuous panel ripped to desired width.

corated grinding room domain he will add, "You never know until you get going. But if I were to start from nothing I'd always consider more space —more room for products moving back to the shipping shed. Everything can be laid out as the plant wants it, all to the best advantage, and still there is always this need for more space."

Question Ed about scheduling and he's apt to say, "Dog-gone hard." But considering the number of parts put out in a week, the number of individual machine setups, woodworking plant superintendent John McNett and his crew do an amazing job.

Unquestionably one of the secrets of the efficient flow of material from raw state to remanufactured wood products lies in the company's good personnel relations. Long-employed key men somehow sense the most efficient way to meet tough schedules. No flow-sheet or blueprint can substitute for this reward of good management.

Everything in the plant is on one level except the glue clamp machine and the finger joint machine.

It Takes Good Community Relations

Biles-Coleman sponsors a weekly radio program titled "You and Your Timber." The purpose of the program is to try to educate small timber acreage owners in the community on how best to manage their lands—how to be profitable tree farmers.

Other forest agencies are invited to participate in the program. The state forestry department, for example, may discuss timber cutting permits and Christmas tree cutting practices; the U. S. Forest Service or the Indian Service may cover the topic of hunters in the woods.

Each year one youth in the community is awarded a $500 scholarship to the University of Washington school of forestry.

Advertising copy in the local newspaper generally has a public education theme. Company management feels it is its duty as well as good business to explain itself and the forest industry to the community it serves so ably.

For a woodworking plant to be the pillar of its community for 30 years is no modest achievement. Biles-Coleman promises to smash this past performance manifold!

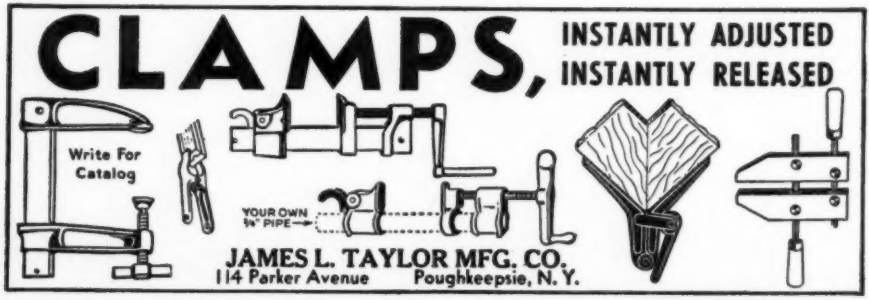
A lie is a poor substitute for the truth, but the only one so far discovered.

"Is smoking permitted here?" asked the passenger.

"No," said the conductor.

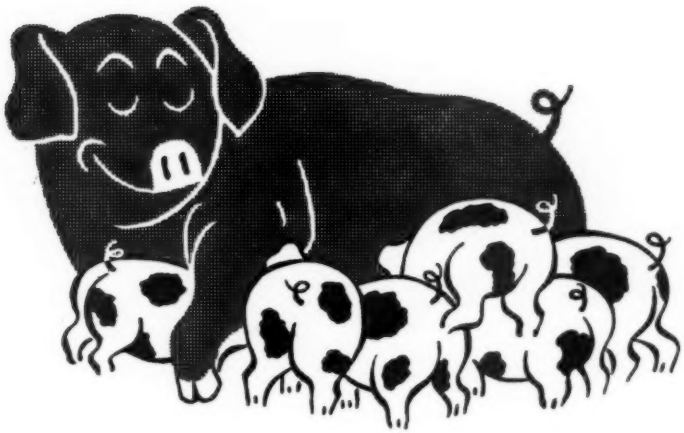
"Well, where did all these cigarette butts come from?"

"From people who didn't ask questions."



To mention dimension *means*

Morgan Manufacturing Co., Inc. BLACK MOUNTAIN, N.C.

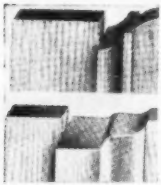


Making many small parts, we can and do use a large proportion of our lumber and this economy is reflected in your costs.
...and we like to quote

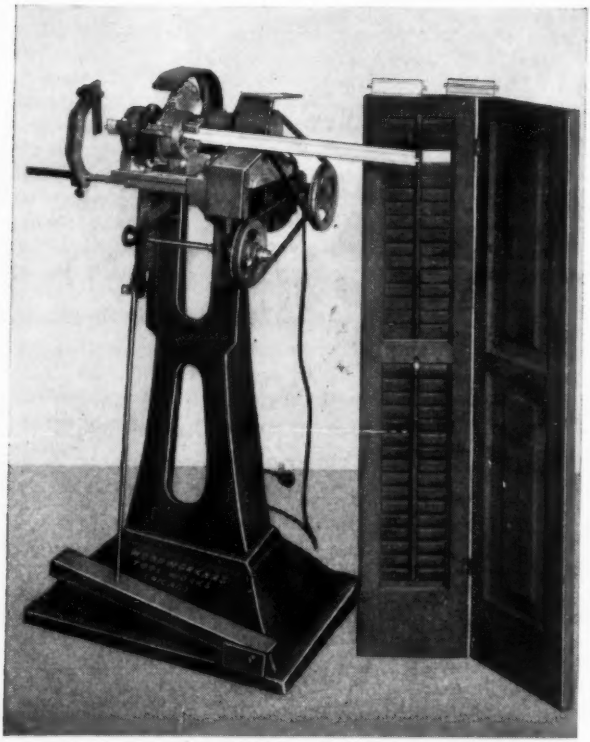
Morgan Manufacturing Co., Inc. BLACK MOUNTAIN, N.C.

The Nation's largest and most diversified producer of **WOOD DIMENSION** for furniture makers and other industries

KNOUREK ELECTRIC SASH COPER



Fast, clean, accurate production, with solid steel cutters revolving at 3600 R.P.M.—For divided light and fancy sash 1⅛", 1⅜" & 1¼"



Bench machine for sash munts and floor model for heavier door and sash bars.

Also soon in production *Knourek Sash Machine* for slotting check rail bars, coping and tenoning stiles and rails. Permanent set up for 5 operations. Machine will complete sash in few minutes.

Woodworkers Automatic Blind Slat Tenoner

Designed for tenoning slats for moveable shutters. Automatic in operation, cutting 2 tenons at one time with saw separating slats—adjustable for any length and diameter of tenon with cutters to produce chamfered tenon ends for easy insertion into stiles. Motor driven single or three phase.

WOODWORKERS' TOOL WORKS

220 SOUTH JEFFERSON ST. • CHICAGO 6, ILL.

KILN DRYING *Forum*

Question

The "Quality Control boys" are in my hair with shrinkage standards, setting limits for volumetric, tangential and radial shrinkage from tables they got from some handbook. I get good results in kiln drying, with little degrade, but this shrinkage deal has me down. How are these table figures determined and how much leeway should I have beyond their standard values?

Answer

It is difficult to determine why shrinkage limits are being stressed rather than uniform moisture content and stress-free condition. Without knowing the handbook used, procedure used at the Forest Products Laboratory to determine volumetric, tangential and radial shrinkage values as shown in its "Wood Handbook" are offered in explanation. The shrinkage values shown in this publication, based on green dimensions and expressed as percentages, represent averages of measurements of 1 x 4 x 1 inch specimens in drying from green condition to the oven-dried condition. It is difficult to set definite limits of "leeway," your request, as shrinkage is an extremely variable property, influenced directly by the density, size and shape of the specimen as well as by drying conditions to which the specimen is exposed. If you will supply more detailed information regarding these various factors, more specific recommendation may be possible.

Question

I have been complaining of season checks on the surface of lumber I am supposed to dry in good condition. This condition is most common to the wider boards and my contention is that this checking is due to uneven drying. How can I explain the conditions that cause this checking?

Answer

Seasoning checks usually come from uneven drying and tangential and radial shrinkage difference. As stated by a lumber seasoning expert, "Checks caused by uneven drying may be due to one of two conditions. With excessive rapid surface drying, the outer layers become much drier than those in the interior and tend to shrink before the inside portion is dry enough to do so. The stresses thus set up in the piece may cause checking. . . . The other condition causing checks obtains when a portion of the piece is shut off from the air. The exposed portion begins to shrink before the protected one is dry enough to do so, and checking occurs in the shrinking portion because of restraint of the unchanged one. Stickers are often responsible for such checks in the stock. The checking in plain-sawed pieces for which the difference between radial and tangential shrinkage is responsible occurs because the face of the piece that is closer to the heart is more nearly a radial face than the other. Such a piece also tends to cup, but because it may be restrained by the stickers, the stresses set up may result in checking. The avoidance of excessively rapid drying tends to reduce all forms of checking, while a decrease in the area covered by the stickers will materially lower the amount of checking resulting from differences in exposure to the air.

Question

Our yard foreman and myself have a difference of opinion regarding box piling for the kiln. He contends that long boards should be scattered through the stack and

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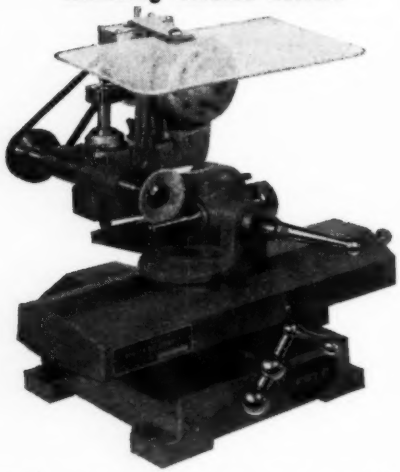

The primary purpose of this motorized, positive indexing Router Bit Grinder is to eliminate freehand grinding on hundreds of small cutting tools. The machine sharpens high speed and carbide cutters on an entirely mechanical basis, with extreme precision, saving cutter life and improving quality and quantity of production. Write for circular.

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327 Dorchester Ave.
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that it is common practice to pile short boards all to one end as long as the end is alternated in successive courses. Can you straighten us out on this point?

Answer

It seems to be general practice in building box piles for kiln drying to group the long boards in tiers at the sides of the pile, instead of distributing them throughout each layer, and to alternately stagger the short boards from end to end. It is also very important that proper support be provided under both ends of each and every board to prevent unsupported overhang.

Question

We are in the preliminary stages of selecting a dry kiln for our operation. The kiln engineer advises that our heat source is inadequate to service a kiln but our own engineer claims it is ample to evaporate the water in any lumber we will dry. We feel that the kiln engineer is trying to sell us unnecessary equipment. Can you advise us regarding heat requirements?

Answer

Recommendation for specific heat requirements cannot be made without more information but generally speaking the kiln engineer is correct in stating you will require more heat than just that required to evaporate water from the wood. As outlined by a kiln drying authority of Forest Products Laboratory the total heat required in a conventional lumber dry kiln in addition to that required to evaporate water is: 1) heat needed to separate the moisture from the first elements of the wood structure; 2) heat necessary to raise the temperature of the wood and water from outdoor conditions to the conditions of drying; 3) heat loss by venting the kiln to remove the evaporated moisture plus the heat required to bring the incoming fresh air up to kiln temperature; and 4) heat lost by radiation from the kiln structure.

Question

What is "critical temperature" in kiln drying?

Answer

Basically, critical temperature refers to temperatures which should not be exceeded when lumber is green, regardless of the relative-humidity control provided. As a limiting temperature, it will vary with

species and initial moisture content and has a direct effect upon checking and honeycombing. A practical definition of critical temperature refers to it as the initial drying temperature used for drying green wood that, if exceeded, may result in surface checking or eventual honeycombing. In the latter application it is based upon the modern theory that honeycomb may be caused by a temperature-duration effect that so reduces the strength of wet wood perpendicular to the grain that the interior fibers are pulled apart by moderate tension stresses in the latter stages of drying.

Question

Why is steam heating so generally used in dry kilns?

Answer

The most obvious answer would seem to be flexibility provided in dry kilns where steam is used for both heat and humidification. In many cases steam is readily available from major plant operation and in others is the most economical medium. Steam is also required in many kiln operations for stress-free conditioning at the end of the kiln run. Finally, steam is more easily controlled than some other heating and humidification mediums.

Question

We have been approached with a proposition involving the construction of a converted tobacco drier for use as a low-cost drying kiln for drying construction lumber. Can you give us an idea of basic equipment and tell us whether these driers have ever been used for lumber drying?

Answer

These tobacco driers usually use an oil-burning furnace as the heat source and some form of external blower for air-circulation. They have been used to a limited extent for lumber drying where end-use requirements are not too rigid. In fact a concern specializing in the construction of tobacco driers has developed a special design for lumber drying.

"When I get to bed at night, I always see green signals and red signals in front of my eyes."

"Did you ever see a psychiatrist?"

"No, only green signals and red signals."

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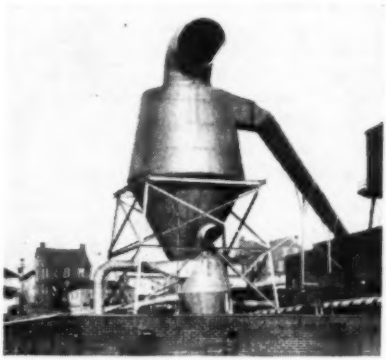

Large cyclone collector is part of Dixie Installation at Red Lion Furniture Co., Red Lion, Pa.

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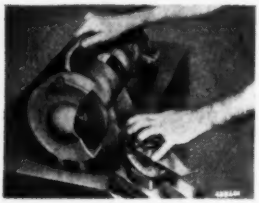
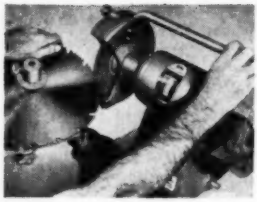
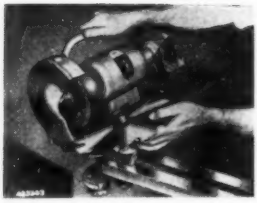
CIRCULAR SAW GRINDER







The new model 3140 Foley grinder provides circular saw users a dependable unit for sharpening all types of circular saws— rip, crosscut or combination toothed—from 5" to 44" in diameter. The grinder is equally suited for maintenance purposes by circular saw users and for service shops doing custom filing. Positive settings provide correct pitch on all teeth as well as uniform tooth height, depth and bevel. Saw tilts to 45° both ways for bevel grinding.

Firmly anchored saw support insures grinding accuracy, prevents vibration. Model 3140 Foley grinder meets all safety standards, including emery wheel guards. High speed 1/3 h.p. motor has lifetime lubricating ball bearings.

Write Dept. 32, Foley Manufacturing Co., Minneapolis 18, Minnesota.

PLANER-MATCHER-MOLDER

Supreme Woodworking Machinery Corp., 50-52 Howard St., New York 13, N.Y., has introduced a new machine which will plane or mold all 4 sides of large size timber in one operation. In addition, the 4-Sided planer-matcher-molder acts as an efficient power-fed surfacer. It can also be run with 1, 2, or 3 heads as needed, eliminating power waste in the unused heads. When dressing 4 sides, the machine handles pieces up to 24" x 4", and up to 7" thick when dressing 2 sides. Variable speed control permits feeding at from 26 to 66 f.p.m.

Rigidity and freedom from vibration have been achieved by designing the main frame with a low center of gravity and large floor contact area. Lumber is fed through the machine by 5 rollers, powerful enough to feed the largest pieces through heavy cuts. Cutter blocks are normally of the circular type, with four thin knives and wedge fixing, but square blocks with slotted knives are available. Doors are provided for adjustment and lubrication of enclosed working parts; no dismantling is necessary. All motors are mounted on the machine.

NEW WOOD PRESERVER

A new wood preserver is now on the market. The new product is called Pentox and contains pentachlorophenol plus rosin amine D, which has made much of this improvement possible.

Rosin amine D penta is a resinous instead of a crystalline material and consequently does not "bloom." This same material has an appreciably lower vapor pressure than pentachlorophenol, which minimizes loss of active ingredients through volatilization. There is also no loss of effectiveness at temperatures down to 32°F, because of a new and exclusive Pentox formulating technique which prevents the precipitation of water repellents and sludging.

In addition, a new, speedy solvent system is used in the formulation of Pentox. Under proper conditions, this permits painting over the treatment in as little as four hours. Pentox is packaged in 5 gal., and 54 gal., units in either "Ready-to-Use" or "1-to-4" concentrate form. For literature and full details, write Osmose Wood Preserving Co. of America, Inc., 980 Ellicott St., Buffalo, New York.

THE NEW BOICE-CRANE MASTER-MONOTROL* 10-INCH TILTING ARBOR SAW

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★ RIPS SUPER STRAIGHT!

★ CUTS MITERS THAT REALLY FIT!

Not to be confused with 10-inch saws of questionable quality and dubious accuracy designed for homecraft use only!

SPECIFICATIONS

Saw Blade Travel: 0 to 3¼"

Arbor Speed: 4000 rpm's

Capacity: Cuts off 15" wide, 1" thick
Cuts off 13⅞" wide, 3" thick
Rips to center of 6 ft. wide stock

Power: to 2 HP 3-ph, to 1½ HP 1-ph.

Arbor: ¾" dia.

Table Size: 36" w. x 27½" l. with extensions

Meets Every Demand for Capacity, Long Life, Sturdiness

Produces Superior Cabinet Work in Construction and Maintenance—Store Fixtures—Better for All Commercial Woodworking. Guarantees Permanent Accuracy, even with abusive use.

ENTIRELY NEW TYPE TRUNNION

Exclusive with Boice-Crane. All critical parts, support surfaces, bearings and contacts are oversize, extra rugged. Many parts actually equal in size to those on 12-inch saws.

SINGLE CONTROL FOR POSITIONING BLADE

New Monotrol* saw blade positioning system reduces blade controls to a SINGLE large handwheel, plus a height lock and a tilt lock, all mounted on the FRONT—equally convenient for right-handed or left-handed operators! No groping, no out-of-reach controls, fewer accidents, an amazing saving of time on variety work. 5% to 29% faster blade speed. Cuts faster, cleaner, smoother. Up to 44% more ripping capacity without extra attachments.

33-1/3% TO 50% MORE POWER

Heretofore, enough power to cut full 3" hardwood in production was usually available only in 12-inch saws. In a Master-Monotrol* you have a selection of motors offering from a third to a half more power than others accommodating only small frame motors. Boice-Crane full powering guarantees freer sawing, reduced hazard of accidental kickbacks when freeing stock from a choked blade.

Other new features:
Overhung arbor pulley for quicker belt changing and without tools.
Power-packed 3 V-belt drive and larger pulleys.
Start-stop switch which accidental manipulation can turn only "OFF", never "ON".
Blade tilt to left—the safest way for right-handed operators.
Steel all-purpose insert serves saw blades, and dado heads as well, without constant interchange and without extra cost.
Ground cast-iron fence with entirely new micro-control, and easier foolproof adjustments.
37 inches maximum fence to blade, 44% more ripping capacity than most 10-inch saws.

Now, there really IS a new and BIG difference in saws.

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931 Central Avenue • Toledo 6, Ohio

Please send complete details on the Master-Monotrol*.

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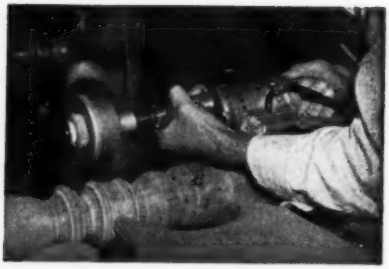
*Tradename Reg.

Note how the brushes force the abrasive cloth down into the grooves.

Sand-O-Flex is being used for finishing spiral lamp stands.



Used portably, Sand-O-Flex sands intricate parts without "flatting" contours.

13,000 sanding strokes a minute

on curved, irregular wood surfaces

Sand-O-Flex gets in and around complicated parts where no other sander can reach. The tedious jobs formerly done by hand are now successfully sanded at top speeds.

Model 650C (above left) consists of 12 abrasive strips backed up by 12 replaceable brushes attached to a metal wheel. As the wheel spins the brushes mold the garnet cloth to the work shape, and when rotated at the usual motor speed you get 13,000 sanding strokes per minute! Compare that with any other form of contour sanding.

The abrasive strips feed out from a central magazine. Refill cartridges are supplied in a wide range of grits, from coarse to very fine, for all types of sanding. Easily loaded—no locping, gluing, or fastening ends. By changing to aluminum-oxide abrasive cartridges, Sand-O-Flex may also be used for finishing metals, plastics, rubber and other materials.

Sand-O-Flex is an attachment, fits your present power tools, portable or stationary. No need to buy stands or special equipment. Four models now available—from light duty to heavy production-line runs.

There is a job for Sand-O-Flex in every woodworking shop and there is a Sand-O-Flex sander for every job. See your abrasive supply dealer for a demonstration—or write for catalog and prices.

MERIT PRODUCTS, INC.
4023 Irving Place, Culver City, California

Manufacturers of SAND-O-FLEX and GRIND-O-FLEX abrasive tools

FINISHING

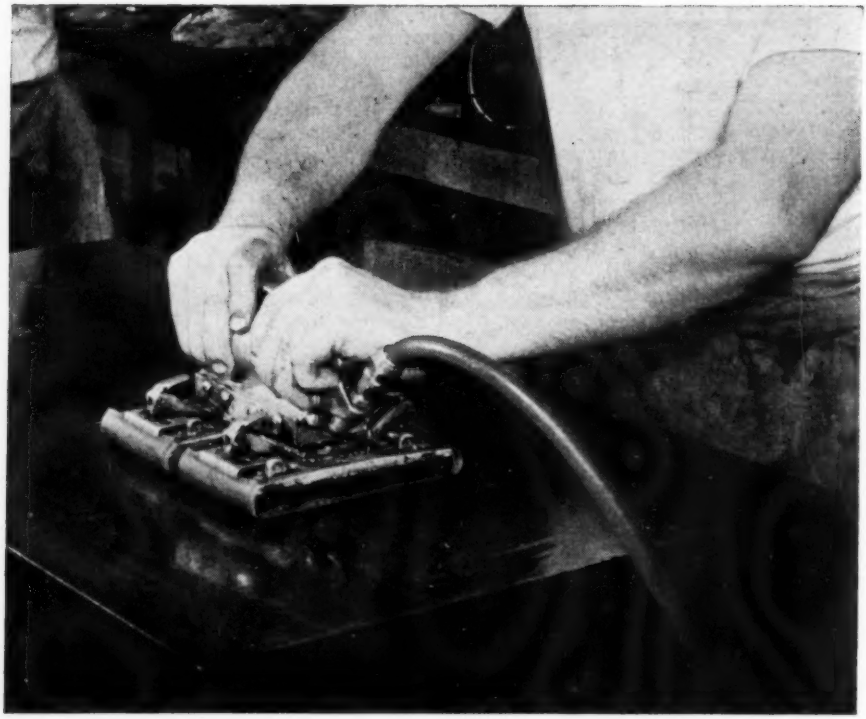
Courtesy DeVilbiss Co.

How to Select An Abrasive

By C. A. Baker

Blond Finishes for Light Woods

By H. H. Connelly



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HOW
To Select An Abrasive

By C. A. Baker, *Supervisor Technical Service Department, Minnesota Mining & Manufacturing Co.*

A GOOD finish is one of the best salesmen a furniture manufacturer has. If the final finish is not pleasing it detracts from the appeal of the article, regardless of its design, the amount of craftsmanship involved or the kind of wood used in its manufacture.

The "groundwork" for the final finish is laid long before a piece of furniture enters the rub room for completion. From the drum sanders through compounding, each sanding operation contributes to the quality of the final finish, and each operation depends heavily on the use of the right coated abrasive and proper sanding methods.

To make a wise selection of the coated abrasive best suited to a given operation, it is necessary to know something of the makeup of a piece of sandpaper—what the component parts are, and how each contributes to the effective end use of a coated abrasive product.

The components of a coated abrasive fall into three general categories: minerals, backings and bonds. When skillfully combined, these elements and their variations offer many types of coated abrasive constructions from which to choose the right sandpaper for each wood sanding job.

Mineral Heart of Abrasive

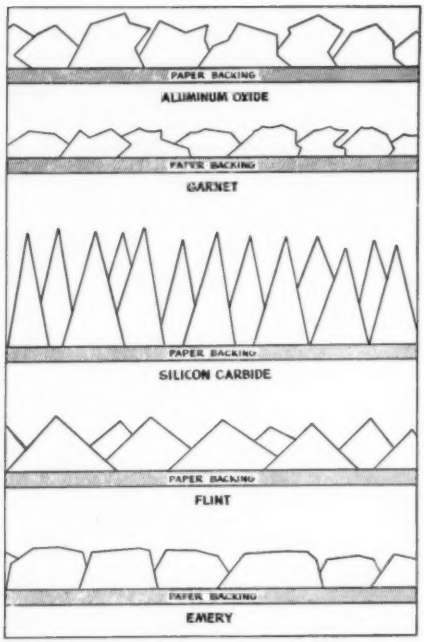
The mineral is the heart of a coated abrasive, and the ability of the mineral to do its job under pressure and prolonged use determines to a large degree the effectiveness of a coated abrasive belt, sleeve, disc or sheet.

There are five minerals used in coated abrasive manufacture: flint, emery, garnet, aluminum oxide and silicon carbide. The first three are natural minerals, taken from the ground in mining operations; while aluminum oxide and silicon carbide are synthetic minerals, fused in the intense heat of electric furnaces according to rigid specifications.

Flint and emery have no place in woodworking production, since flint dulls rapidly in use, and emery offers little cutting action.

For many years garnet has been a major coated abrasive mineral used in woodworking plants. It is tougher than flint, and although it, too, is a natural mineral the grains are heat treated prior to sandpaper manufacture so that they attain a desirable hardness. As the mineral grains break or refracture in use, new cutting edges are formed. This ability to refracture tends to resist loading or filling, which is charac-

In subsequent articles, Mr. Baker will discuss types of backings, and methods of pre-flexing coated abrasives for special jobs. He will also point out why certain combinations of minerals, backings and bonds are recommended for each specific wood working operation.



If greatly magnified, the grains of the five minerals used for sandpaper manufacture would look something like this.

teristic of many wood sanding operations.

Garnet is a comparatively long-lived mineral for operations in which operational speed is not a factor. High speed operations will result in too rapid fracture of the mineral, and consequently a premature dulling of the coated abrasive.

Aluminum oxide has many-sided, sharp-edged grains which are extremely tough. This coated abrasive mineral is a clean cutting tool, particularly effective for high speed finishing of white wood. The fracture of aluminum oxide grains can be compared to the shape of hollow-ground edges of chisels and plane bits used for woodworking.

Silicon carbide has been found to be the ideal mineral for sanding and finishing hard, brittle materials. It will penetrate almost any surface (it is second in hardness to the diamond) and cuts rapidly because of its extreme hardness and sharpness characteristics. These characteristics make this mineral especially suited to final finishing operations. However, due to the mineral's brittleness, it will rapidly fracture and prematurely dull if used for high speed machine operations.

Extensive usage both in the laboratory and in the field has proved that since certain minerals perform better in some operations than in others, garnet, aluminum oxide and silicon carbide are all required when the right coated abrasive is to be used for a specific wood working job.

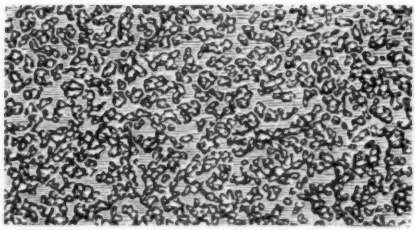
Need More Than One Grit

It is obviously not feasible to do all sanding jobs with one grit of sandpaper; therefore, selection of grit sequences is extremely important. Sizes of coated abrasive minerals used in the woodworking industry are designated in two ways: by the grit symbol, and/or the mesh number.

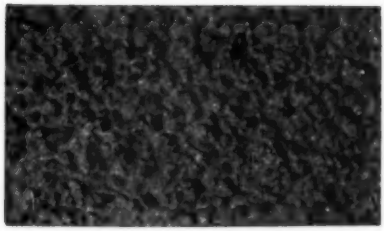
The grit symbol—the older and more common of the two—is a standardized arbitrary marking method in which sizes of mineral grains run from 4½ (the largest or coarsest), to 10/0 (the smallest or finest).

The mesh number is a later type of grit designation paralleling grit symbols, deriving its name from the mesh through which it is graded. The mesh number indicates the number of openings per lineal inch in a standard con-

Illustrations in this article are furnished through the courtesy of Minnesota Mining and Manufacturing Co.



Surface of open coat sandpaper is about 60% covered with mineral grains.



Surface of closed coat sandpaper is about 100% covered with mineral grains.

trol screen. This marking system includes 22 grit sizes, ranging from 12 (the coarsest) to 600 (the finest). The two systems compare this way:

GRIT SYMBOL	MESH NUMBER
	600
	500
10/0	400
	360
9/0	320
8/0	280
7/0	240
6/0	220
5/0	180
4/0	150
3/0	120
2/0	100
1/0	80
½	60
1	50
1½	40
2	36
2½	30
3	24
3½	20
4	16
4½	12

The mineral is, in fact, the heart of a coated abrasive; yet, the manner in which it is applied to the backing is the key to how efficient it will be in use. Simply "throwing" mineral grains on a backing surface haphazardly will not produce an efficient sandpaper. The mineral application must be controlled to assure proper orientation and spacing of the grains.

Coating Methods

There are two basic methods of applying mineral grains to a backing: gravity coating and electrostatic coating.

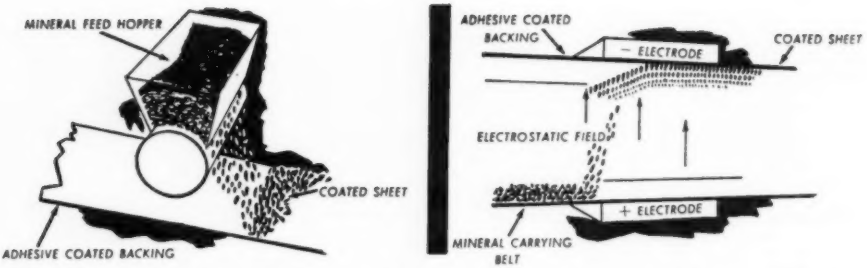
By the gravity method, the mineral grains are placed in a hopper which drops them on a moving strip of backing that has previously received an adhesive coating. This method is modified in many ways to orient the cutting edges of the mineral grains to the best advantage.

The electrostatic method utilizes an electrically charged field through which mineral grains are moved beneath an adhesive-coated backing, which has the adhesive facing the mineral. Each mineral grain receives a charge of electricity and jumps upward, imbedding itself in the adhesive on the backing. The result is a uniform layer of mineral grains each positioned with its cutting edges exposed.

Using either method, there are two types of mineral coatings: closed coat and open coat.

Closed coat sandpaper has its surface 100% covered with mineral grains, and should be used in preference to open coat when possible. It is faster cutting and longer-lived than open coat because there are more mineral particles to share the work burden.

A piece of open coat sandpaper has mineral grains on approximately 60% of its surface. This type coating is



Schematic drawings of the two methodsof coating sandpapers. Left: the gravity system; right: the electrostatic method.

specifically designed for operations in which loading or filling is a problem. The "valleys" or open spots between the grains allow a clearance for sanding dust.

Any discussion of coated abrasive minerals and coating procedures would be incomplete without a consideration of bondings—which hold the mineral grains in place on a backing. Without an effective bond, the mineral cannot perform efficiently.

Types of Bonds

In general, there are five types of bonds used today in coated abrasives manufacture: glue, resin, glue with filler, resin-over-glue, and waterproof.

Of the five, a bond of pure hide glue is best suited for most wood sanding operations, and is widely used. The efficiency of glue bond coated abrasives is increased by application of anti-friction materials to sanding pads and abrasive belt backings.

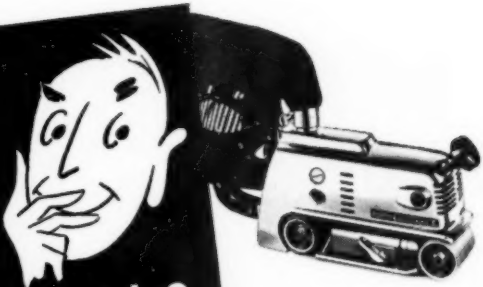
A bond composed of synthetic resins has been developed for certain operations in which there is high frictional heat; however, due to its stiffness and lack of flexibility this bond has limited usage in the woodworking industry.

A third type bond is one of glue to which an inert filler has been added to provide increased hardness and strength. This bond is primarily used on coarse coated abrasives designed for heavy duty work.

A bond consisting of a layer of glue and a layer of resin has heat resisting properties of resin, as well as much of the flexibility of glue. It is recommended for operations in which heat and flexibility are both factors.

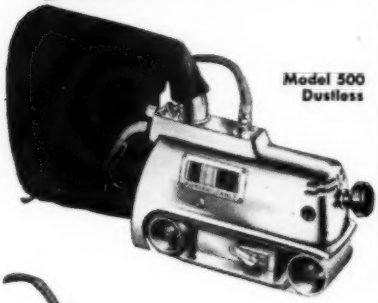
One of the most important developments in the history of coated abrasives is the waterproof bond, used for operations requiring a lubricant. It is composed principally of synthetic resins, and is completely resistant to water, oils, solvents and the like. Because of its nature and the type of woodworking operations for which it is recommended, sandpapers made with waterproof bond are highly flexible.

Which of these BELT Sanders best fits your needs?



Model 503 Dustless

For production surfacing your best bet is Model 503 Dustless. Powerful vacuum system. Rugged—does the rough sanding jobs formerly handled by heavier, more expensive machines.



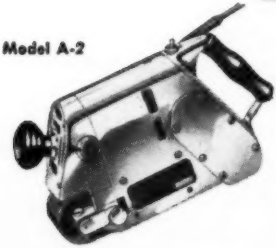
Model 500 Dustless

For heavy-duty sanding you can't beat Model 500 Dustless. 4"-belt makes quick work of broad, flat surfaces. Vacuum bag eliminates flying dust.

Model A-3

For all-purpose sanding take Model A-3. Speedy, versatile, easiest to use for chamfering and rounding edges; surfacing wood, metal, composition, etc.

For light touch-up choose Model A-2. Its 9-lb. weight and 2"-wide belt help you develop the necessary deftness for super-fine finishing or light stock removal.



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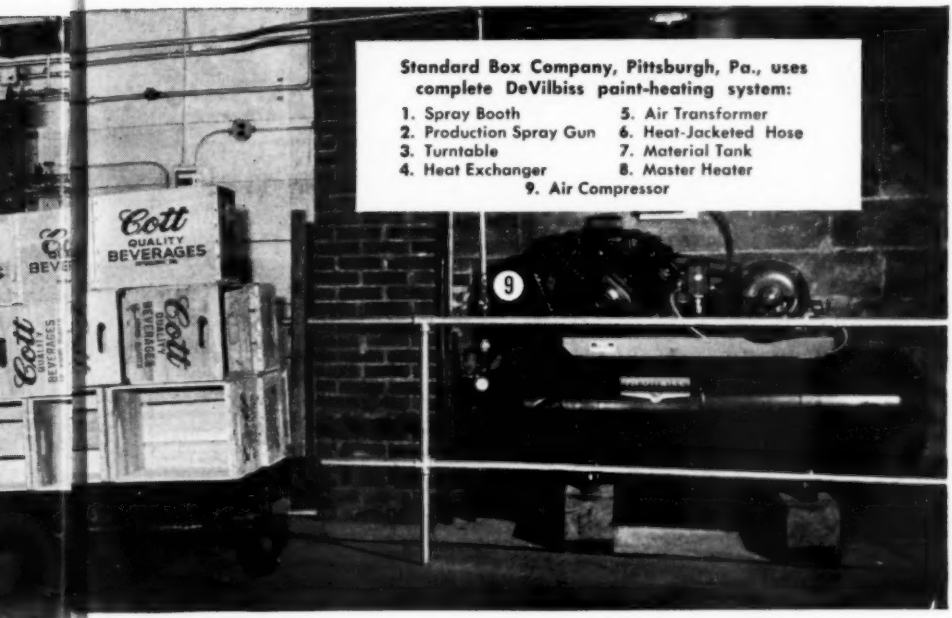

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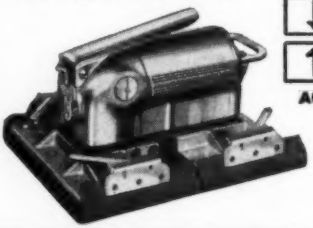

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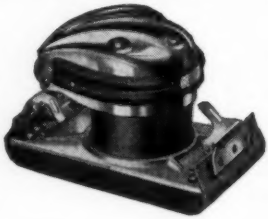

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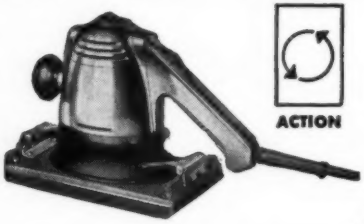

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BLOND FINISHES For Light Woods

By H. H. Connelly

THE first important operation in securing a quality light finish is found in the careful selection of the wood for grain, uniformity of color and texture.

This is best accomplished by samples. From the brief description given of the light colored woods commonly used for blond furniture, you can see there is a variation of shade in color. In the manufacture of a suite of furniture, it is immeasurably important to maintain this uniform color for all pieces.

For example, in finishing a bedroom suite, it is important that we maintain a uniform color on the dressing table or chest of drawers so that when grouped, no distinction is apparent between these pieces and the bed.

A number of light woods are available for the construction of modern furniture taking this familiar light finish. And, it should be pointed out, that unless you expect to use a heavy pigmented toner to obtain this light finish, it is necessary to select a wood of light color to start with.

Heavy toning is painting. It covers the grain and a contrasting filler is necessary to define the grain on porous wood from the French Ivory Coast and more credit to nature's work and allow the grain to show. It should bring out and actually focus the attention on the grain character.

Recommended Woods

Avodire, known technically as Turraeanthus Africana, is an excellent wood for blond furniture. It is an African wood from the French Ivory Coast and the Gold Coast where it is called apaya. The color, however, varies from a dull paper white to a beautiful light, golden cream shade, strongly figured and of fine texture.

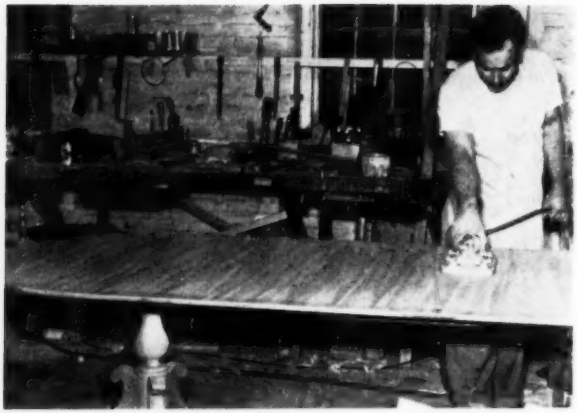
Another light wood you will find plentiful for blond finishing is primavera. This is a South American and Central American wood from Guatemala, Salvador, Honduras or Southern Mexico. The color is yellowish white to light yellow brown with a fairly high luster. The grain is straight and when quarter sliced will produce veneer running from straight stripe to highly figured. Frequently the veneer is marketed under various names as polo blanco, blanco and white mahogany.

Frequently mahogany is bleached to a blond finish, however, this is a somewhat different operation and will not be discussed here.

White maple or hard maple is suitable for blond finish. This maple is selected for the white sapwood and is clear of dark defects. To expect to bleach out dark wood defects is a mistake and these must be eliminated before the parts are processed.

Both oak and birch are suitable woods for light finishes.

Light limba, also known as white frake, is another wood of light color that takes a blond finish. The color varies from a pale yellow to a light brown.



Rubbing lacquer on Sheraton dining room table.

Courtesy Carborundum Company

Another species of light wood is known as satinwood, very comonly referred to as West Indian satinwood. The satinwood from Puerto Rico was considered the finest in the world but the supply is exhausted. British Honduras produces several species in fairly good quantity, all of them lustrous yellow satinwoods. The wood is always a bright golden color, sometimes you hear it referred to as molten gold by veneer salesmen. The veneers are available in 1/28" thickness. The cost, however, runs considerably higher than other woods available for blond finish.

The finishing schedule for blond which follows will correct, to some extent, slight variances of wood color, but wide differences in wood shades are difficult to correct without heavy opaque shading, giving an objectionable painted effect.

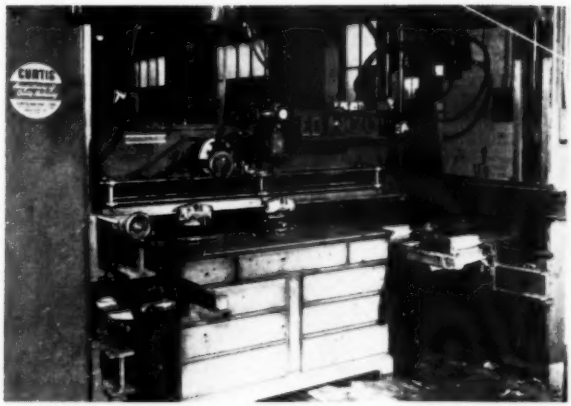
To some extent, this variable can be narrowed by a careful cutting of the flitch veneer into the different parts. No two flitches, if cut from a different log, will be exactly alike. For this reason you should insist upon a balanced cutting. For example, out of each flitch secure cuttings for all parts of one suite. This places a burden upon the final assembly. However, if these parts are processed closely together they can be matched for assembling later.

Toning—First Operation

An excellent finishing job can be done on blond furniture in eight steps. These operations are: (1) tone, (2) sand, (3) fill, (4) seal, (5) sand, (6) lacquer, (7) rub and (8) wax.

A toner is a pigmented lacquer. The color, obviously must be light. This doesn't necessarily mean white. The

Room divider by Heywood-Wakefield. It is made of birch and is available in wheat and champagne, both light finishes.



Curtis hydraulic automatic rubbing machine.

colors are in the classification of tints—usually off-white to pinkish and hints of tan.

The important things to remember about toners, however, is their use. Colors are formulated by a finishing material supply house; they are applied by your finishing personnel. The final result, regardless of the shades used, is how carefully they are applied.

Toners must be sprayed. In spraying care must be taken to keep the material well atomized; heavy spots of colored lacquer will hide the grain and be conspicuously off-color. For best results use a gun pressure of 50 lb. of air to atomize the fluid. A number 30 air cap and FX needle is quite adequate for a good job.

Use a pressure feed tank. Never depend upon a gravity feed bucket to spray toner! The fluid is a fast evaporator and thickens quickly; the flow drops and your coverage is poor.

A gravity feed tank pressure of 10 lb. per square inch will give an even flow to the gun and insure excellent material supply at all times. No evaporation of volatile solvents can take place.

In spraying toner, mist the material on by using the higher gun pressure and lower fluid pressure. An even wet coat is always desirable. If the toner is correctly formulated, there is no danger of "painting." The toner, if received concentrated, should be thinned with lacquer thinners.

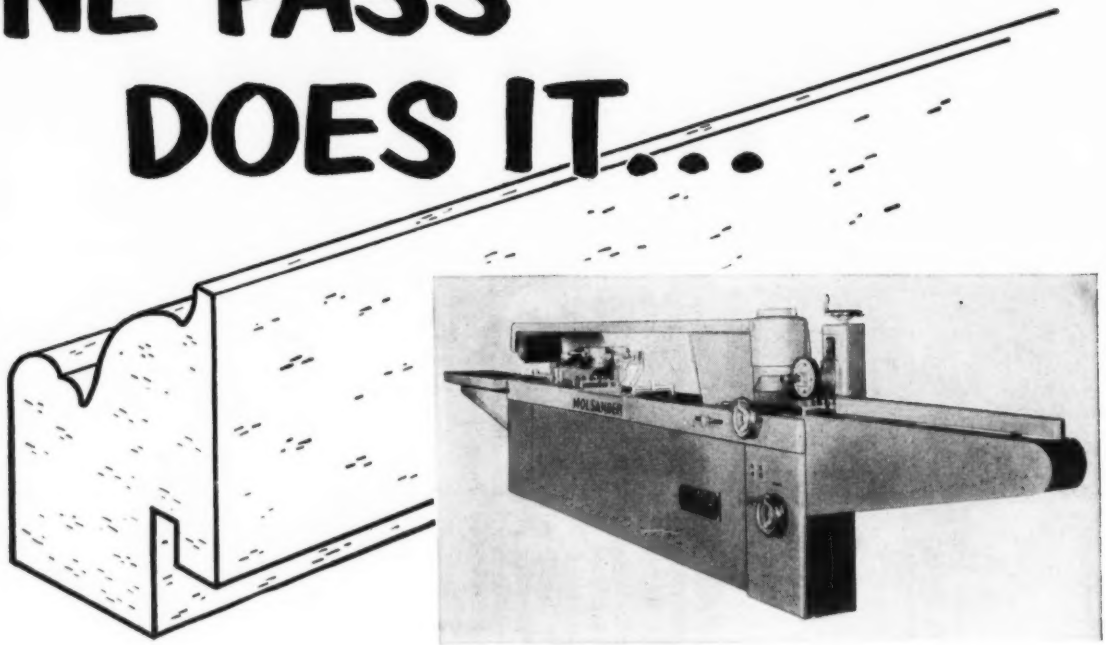
No washcoat is necessary with a properly formulated toner. Ask for a toner-washcoat material.

Sanding and Filling

Following the toner, sanding is optional. There is this to be said for sanding after toner: on soft woods the grain is slightly fuzzy after toning. The surface will fill and wipe cleaner if a light, scuff sanding precedes the filling. No coarser paper than 7/0 should be used. The finest grade of steel wool is recommended for turnings and carvings. Since the film thickness of the toner is very thin, every precaution should be taken to keep from sanding through the pigmented coat.

Filling performs two functions in the finishing of blond wood. It levels the porous wood and provides a smooth foundation for the sealer and lacquer. The second function of filler for blond wood finishing is to add a pigmented color that highlights the wood grain. In performing the second function it serves also as a protector and preserver

ONE PASS DOES IT...



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WITH THE *Molsander 100*

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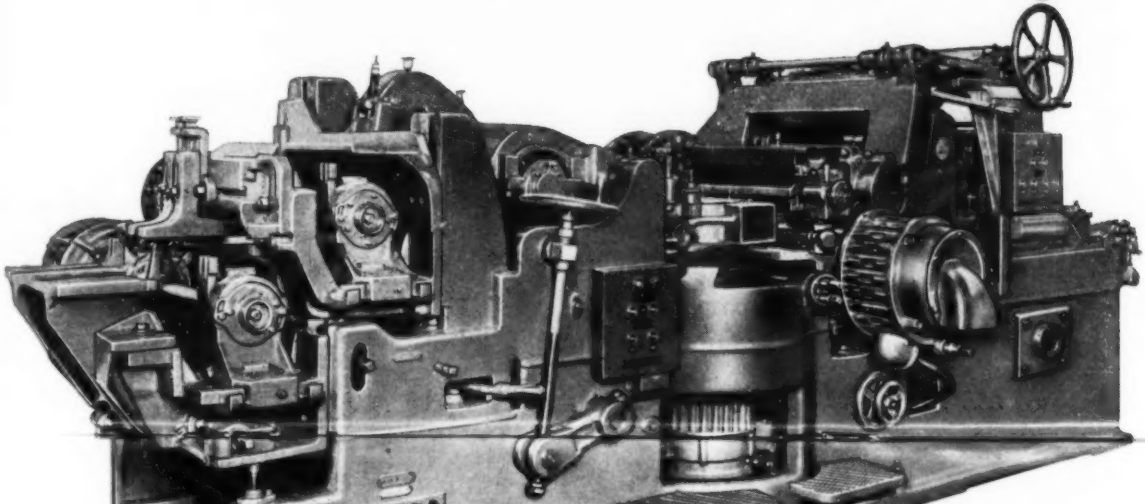

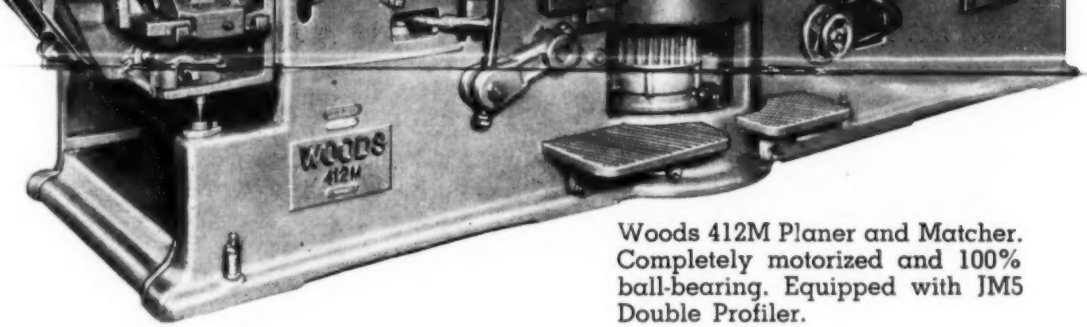

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Workers rubbing a final wax coating on a lacquered cabinet.

of the light color which is darkened from ultraviolet rays. Ultraviolet light affects wood beneath a lacquer film but will not penetrate the pigments contained in the toner coat or the filler.

A filler for blond wood should not be formulated with thinners or oils that darken upon exposure to light—those containing linseed oil, for instance. A suitable filler will dry, under favorable conditions, in four hours. With ovens, this schedule can be considerably reduced.

Methods of Application

There are two methods commonly used for applying filler: by spray gun and by brush. Unless portions of an article of furniture are to be kept free of filler, the spray gun is the best choice.

Filler, for spraying, must be thinned and only a suitable thinner recommended by the filler supplier is recommended. This is more important with todays fillers than the old type; since many of the vehicles used in modern fillers are resins that are not compatible with any solvents and thinners found in the finishing room.

The pressure feed tank should be operated with the minimum of air pressure. Excessive tank pressure wastes material. The correct selection of fluid tip and needle for the spray gun can save material. One company found that by switching from the conventional air cap and needle used to spray lacquer they halved the volume of filler formerly used.

Are your fluid tips and needles wearing fast? Filler contains silex, ground silicon, a very hard and abrasive substance that makes short life of the conventional fluid tips and needles. You can secure these made from a very hard metal that resists wear and corrosion.

Following the spraying the next important step is padding the filler into the pores and cleaning up the surplus material. What is the most efficient method for padding filler?

The oldest method is with burlap rubbed vigorously across the grain. This is slow, expensive, and antiquated. The modern method is with either a rotating pad machine or a reciprocating hand machine fitted with felt pads that move across the grain only, pushing the pasty filler into the wood pores like a bulldozer shoves dirt into a hole.

A manufacturer of blond bedroom furniture recently instituted a combination of the first and second method with excellent results. Immediately after the filler is sprayed on the wood, while still fluid, a rotating padding machine is run over the surface. Being fluid, the filler is easily forced into the pores, leaving a thin film of filler on the entire surface. The remaining filler is allowed to completely flash—almost to the dry stage. The second padding is accomplished with a jigger air sander fitted with felt pads that move across the grain only. The final result is a surface almost free of filler. Consequently, little cleaning up by hand, a costly and slow process, is needed.

Correct selection of fluid tip and needle for the spray gun can save material.

In selecting a filler for your blond wood finish check the property of your material for these desirable qualities:

(1) Dry for recoat in four hours.

(2) Easy to mix and clean up well.

(3) Must be compatible to lacquer sealer and lacquer. (This fault is frequently the cause of lifting.)

(4) Fills and pads well.

(5) Does not shrink in pores when drying.

(6) Does not bleach or turn gray under the lacquer coat.

(7) Wipes clean and produces a clear tone under the clear lacquer coat.

(8) Does not settle out when left in a pressure feed tank. A well compounded filler will not settle and requires a minimum of agitation while working.

A Sealer Must Sand

Why use a sealer? A lacquer sealer performs two important functions. First, it is formulated with low solids content —21%—which contains stearates or sanding aids. Without this sanding aid, sandpaper soon gums and leaves a streaked surface.

The second function of a sealer is to provide a seal for the filled wood and a body to which the lacquer coat can knit to form a tight, lasting bond.

It is well to point out at this time the necessity of choosing a sealer with good color retention qualities. A sealer that turns yellow or dark upon exposure to ultraviolet light will nullify all the precautions you may take to select a water white stable lacquer. When choosing a blond sealer insist upon a water white sealer.

A sealer is applied with spray gun, using a gun pressure of 40 to 45 lbs. and a fluid tank pressure of 10 lbs. per square inch.

One coat sealer is adequate. However, this is no hard and fast rule. One table manufacturer found that in order to obtain the required finish an unusually heavy sanding was needed to level the sealed surface for the lacquer. Consequently the rejects from sand-throughs and light edges were overpowering. A double sealer coat answered his problem.

There is this precaution — a heavy sealer can breed trouble. Cold checking, for one, is often contributed to a heavy, brittle sealer coat.

A new sealer is sold under the trade name of Tufcote. This sealer does not contain a sanding aid—the one ingredient which makes a sealer brittle and subject to cold cracking. In order to sand this new sealer, you must use the stearate in powder form to act as a lubricant between the sealer and abrasive.

One abrasive manufacturer has incorporated the stearate in the paper and markets the product to be used with the special sealer. It is trademarked No-Fil.

With either method of sanding it is wise to clean up the sanded surface

with a tack rag to prevent the lacquer from absorbing the harmful stearate.

For sanding the sealer coat use a 6/0 or 7/0 paper. A jigger sander will speed the operation and is less fatiguing on the operator.

Water White Lacquer
Light Blond Finish

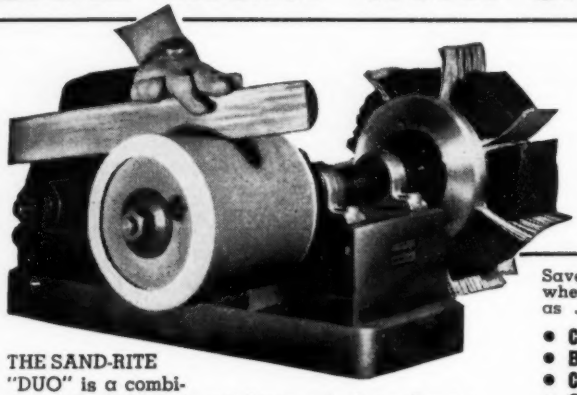
Unlike mahogany, walnut or other dark finishes, blond furniture must have a final coating that is stable to light and will not darken or yellow with age or exposure to light. Varnish, for instance, usually continues to darken with age. Certain synthetics display this same trait.

A varnish film dries by oxidation; that is the oils and resins that make up the varnish film dry by a chemical action. Oxidation is going on in the film, slowly but surely, as long as the film exists. When this action is completed, the coating is crazed and broken down to the point where it is useless as a protective agent for the wood beneath.

Lacquer, on the other hand, behaves just the opposite. Lacquer dries by evaporation. The chemical composition of the film does not change with drying as varnish; only the solvents and thinners have separated themselves from the solids in the drying process. We call this drying by physical action. For this reason lacquer may be formulated which leaves a tough and impervious film, quick drying for rapid production, and good building qualities.

The building properties or depth of a film for blond furniture is not so critical as for the darker woods. For example, you will find many furniture manufacturers are getting satisfactory finishes with less coats. This is quite apparent with the water white lacquers which are formulated at much lower solids content than the conventional lacquers.

SAND RIGHT WITH SAND-RITE



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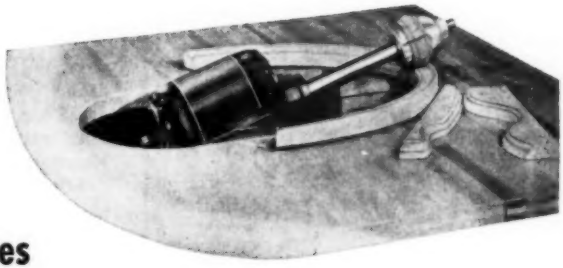

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Lacquers for blond are not necessarily water white. Water white lacquers are manufactured from pure resins free of discoloration and stable to light within a safe range. The initial color is kept between 0-5 on the Gardner Holt scale. A conventional lacquer may occasionally be manufactured from a batch of raw material which will fall within this low color scale. However, other batches may go as high as 15 on the scale, yet meet the specifications set up by the lacquer manufacturer and have poor color stability. In the final analysis the important factor is the color stability. Most lacquers are transparent and white enough to be satisfactory for blond at the time they are applied to the surface. It is a question of Old Father Time and what he will do to the film after the ultraviolet rays have had a whack at altering the color.

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To apply lacquer use a spray gun with a pressure feed tank. The same gun and tank recommended for your sealer coat is satisfactory. It is well to drain all the sealer from the fluid hose and tank before spraying lacquer. Normally 50 lb. of air pressure is adequate for atomizing the fluid. A tank pressure of 10 lbs. will give a heavy flow for high production.

In general, two heavy coats of lacquer are sufficient when spraying flat work. This may have to be increased to three and even four passes when spraying vertical because lacquer will sag if laid on the wood too heavy. Another recommendation to keep in mind when spraying lacquer is to provide a drying time between coats. If you are using air drying, two hours should be ample. Forced drying will cut this appreciably.

Rubbing and Polishing

The effect of rubbing blond furniture with the wrong lubricant, resulting in a later yellowing of the finish coat, was not apparent until a few years ago.

One concern manufacturing blond display cases for the first time, noted that upon opening the packed cases a definite, unsightly yellowing of the surface was apparent. An intensive research program was undertaken to uncover the cause.

The first assumption, naturally, was that the lacquer was not stable. Examination, however, showed that the portions of the furniture unrubbed was not effected.

Various types of rubbing lubricants were analyzed and used as rubbing lubricants then exposed to intense sunlight; some yellowed, some were stable. By a process of elimination, the rubbing lubricants were marked and all yellowing lubricant eliminated from the production line.

In general, it was pointed out that all the yellowing lubricants fluoresced under a black light.

From The

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Nash No. 50
Automatic
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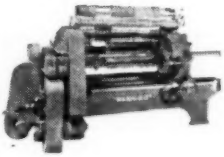

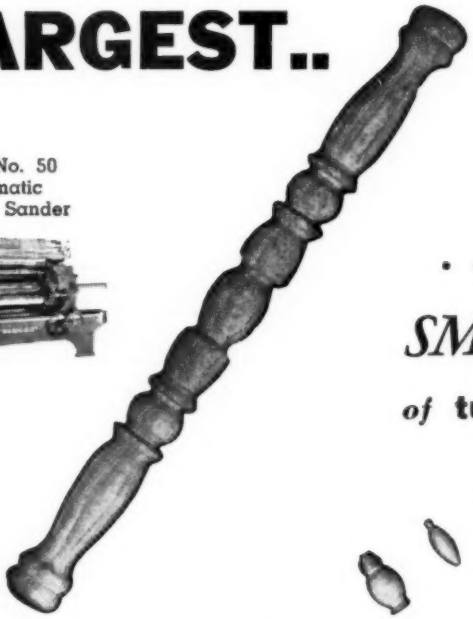

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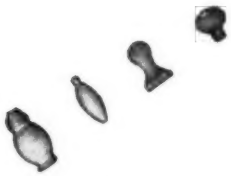

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In addition it was found that sulphur or sulphurides caused a yellowing. A rubber sponge was placed in contact with the table top and allowed to remain for several hours. When removed the exact outline of the sponge was left on the table in the form of a yellow square.

This means that certain types of packing paper can be harmful and promote unstable color on blond furniture.

One rubbing lubricant that is always dependable is water. Water, however, is wet. Unless a piece of furniture is carefully dried after rubbing the moisture may enter the wood around hinge seats, hardware or screws, causing damage to the furniture.

Certain types of water white mineral oil are recommended. If you are unsure of a rubbing lubricant, secure samples before purchasing large quantities and rub a blond panel, leave oil on the surface and expose to intense artificial light or sunlight for several days. Masking tape placed over a portion of the test panel will be helpful for comparison.

A wet-or-dry sanding with 360 paper is the first step in the rubbing operation. Use a jigger sander and lubricant to cut the lacquer surface to a smooth plane. Follow this with hand polishing using 3F pumice stone with an approved lubricant.

In both sanding and rubbing it is well to point out the importance of working with the grain at all times.

A final clean up should follow the polishing. Many concerns use a wash to remove all indications of oils. One concern uses a solution of alcohol, water and mild soap. Naphtha may be used provided it does not contain impurities that will cause yellowing.

Following this, use an approved wax. Buff with a soft rag and your blond finished piece is ready to pack!

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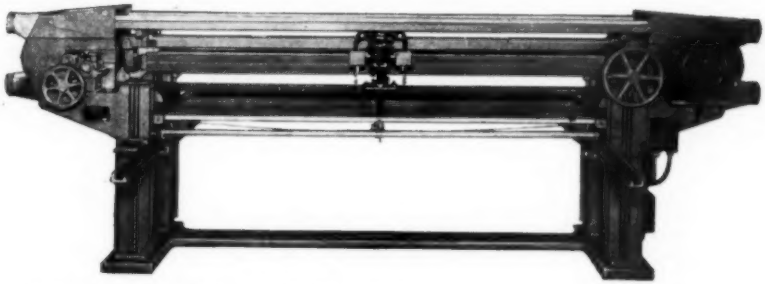

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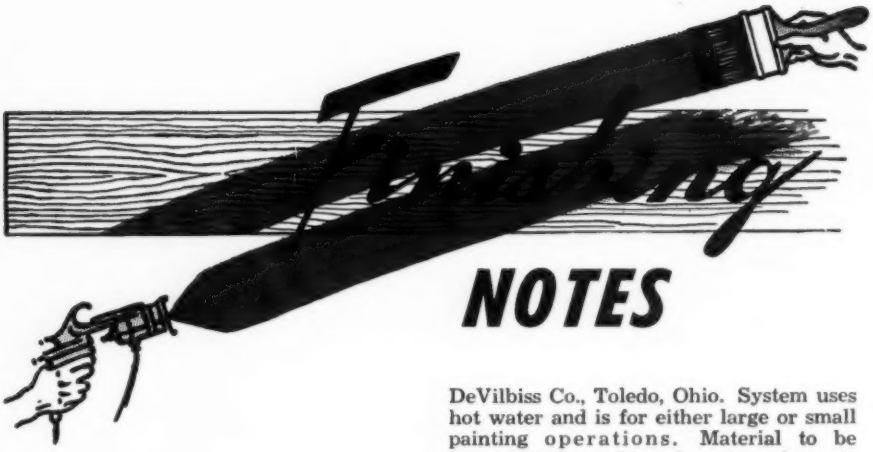

School

The spring sessions of the Binks Spray Painting School will be held April 4-8 and May 2-6. The school will be held at the Chicago plant, 3122 Carroll Ave. There is no cost or obligation on the part of the student. William Beacham will be the instructor. Each class member has the opportunity to operate equipment.

Tack Rags

Free samples of this rag are available from Grenco Mfg. Co., 47 McClellan Terrace, West Orange, N.J. This Klix tack rag is used for final cleaning of finished wood products before finishing. The rag is gauze mesh impregnated with a special chemical blend that is said to never dry out.

Sander

Black & Decker Mfg. Co., Towson, Md., introduce a 7" disc sander. This is a redesigned model of its predecessor. Weight has been reduced by 20%. Universal motor drives sander at 4250 r.p.m. Weight is 10¾ lb. and over-all length is 17¾".

Paint Heater

Better control of organic material temperatures for hot spray process is achieved through a new line of paint heaters by DeVilbiss Co., Toledo, Ohio. System uses hot water and is for either large or small painting operations. Material to be sprayed is heated in a heat transfer unit located near the spray section. Water for the system is heated in a separate unit located wherever convenient. Each spray station must have a heat exchanger for each color which is to be sprayed at that station.

Brochure

Describes a Sand-Rite all-purpose contour sander manufactured by the Sand-Rite Mfg. Co., 226 W. Schiller St., Chicago 10, Ill. Machine is for free hand sanding of curved work or shaped stock regardless of the way the grain runs. Three models of these sanders are available. Pneumatic flexibility of the drum and cushion action of the brush head makes the sanding operation almost automatic.

Flaky Finish

Where a lacquer of too high solids content is applied over sealer, the finish may be hard but very brittle when dry. It may chalk white when marked or scratched. It is likely to flake or peel when exposed to extreme temperature and humidity changes.

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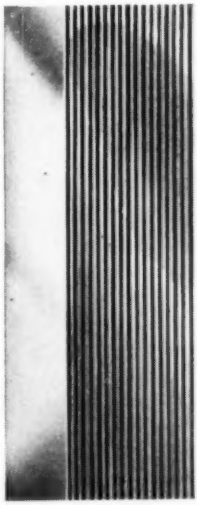

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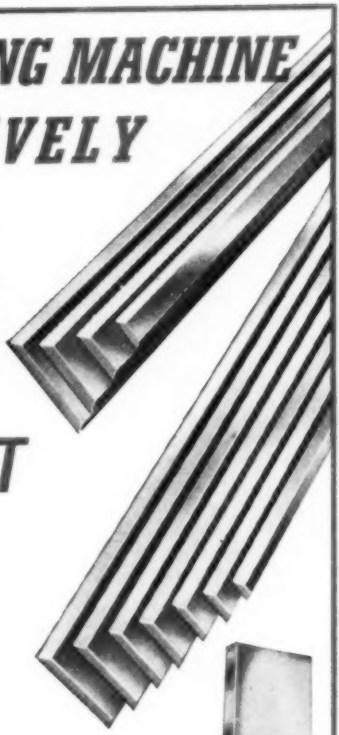

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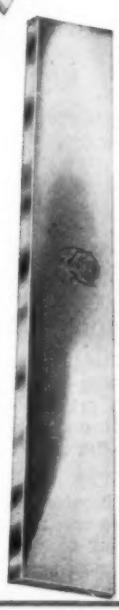

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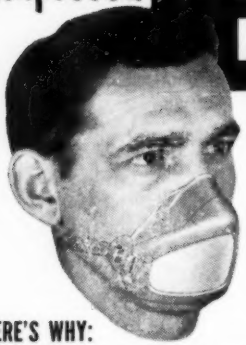

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"The Art of Wood Turning" is filled with information about the use of lathes plus the objects that can be made by wood turning. There is also a section on methods of turning, one on finishing and another on advanced turning ideas.

BOOKLET ON DESIGN

An enlarged edition of the book, "Typical Designs of Timber Structures," longtime standard guide used by architects and engineers in their preparation of plans for light and heavy wood structures, has just been issued by Timber Engineering Company, 1319 18th St., N.W., Washington, D.C., engineering and research affiliate of the National Lumber Manufacturers Association.

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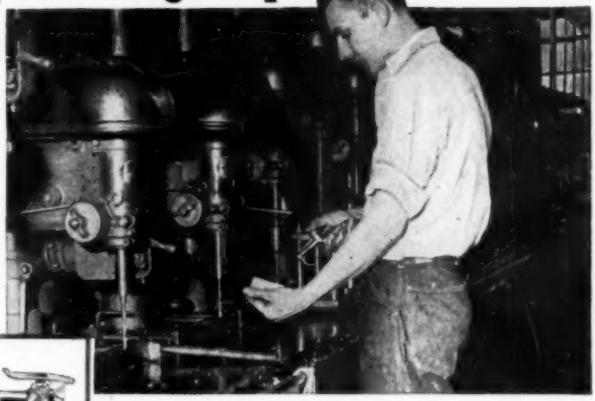

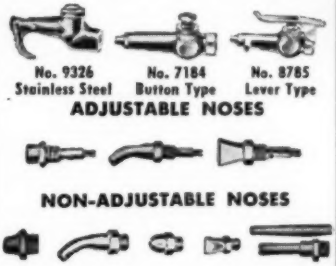

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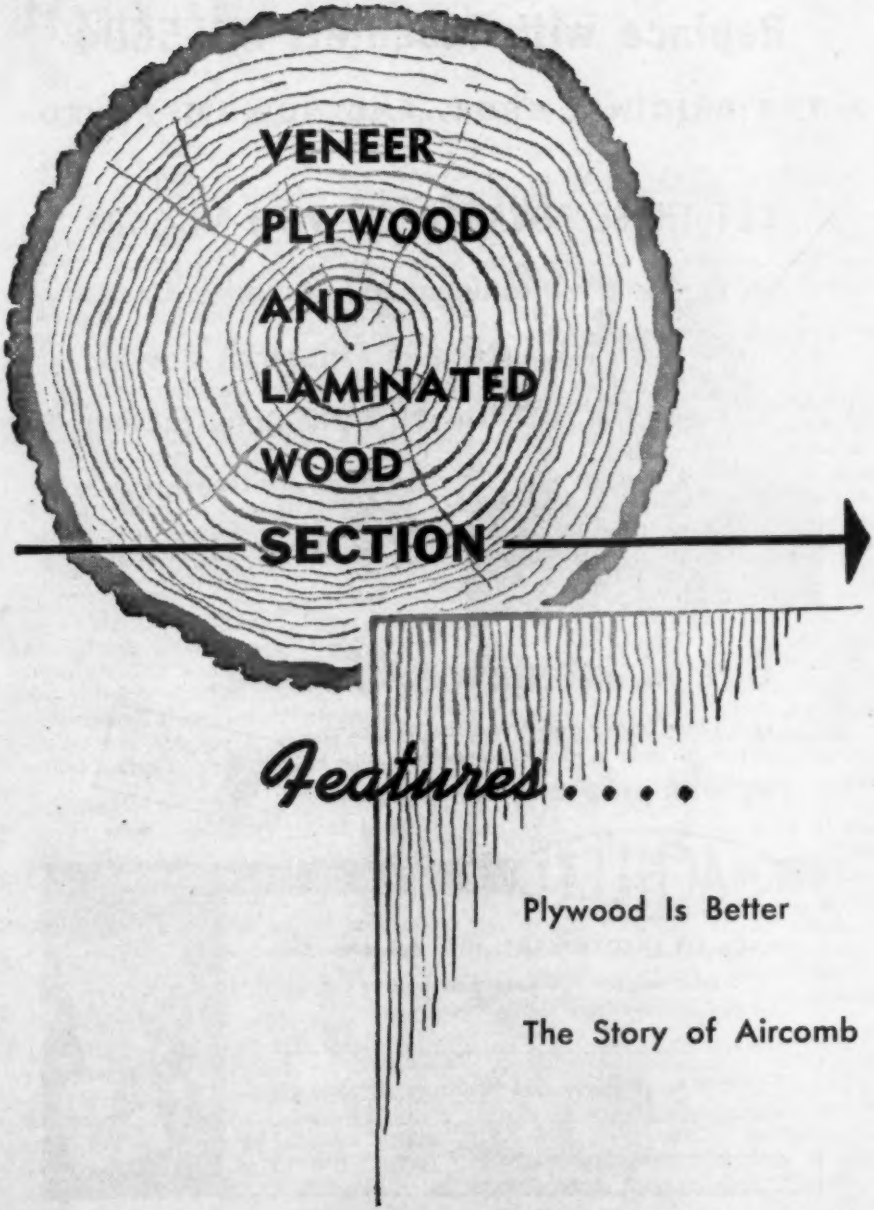

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PLYWOOD

Is Better.... Paneled Interiors

By **Thomas D. Perry**

IN THE last issue particular emphasis was laid on the use of plywood for decorative purposes in furniture. Attention was called to the fact that it is difficult and often impossible to display the more attractive types of grain figure in solid wood constructions. On the other hand, when such crotches, burls, butts and stumps are sliced into thin veneer and glued to a sturdy backing of plywood, their beauty is enhanced and their durability is assured.

There is another phase to this use of thin veneer, in such woods as can be safely used in solid form, i.e., a 4/4 board, would make one item of furniture that would grace one home. But it also can be sliced into thin veneer and provide the "makings" for 25 items of plywood furniture that will afford lasting enjoyment to 25 homes.

A similar contrast is found in the use of solid wood vs. plywood in wall and ceiling paneling, as well as indoors and other built-in interior trim. Most of these structural uses for interiors are too large for the use of crotches, burls, butts and stumps, although there may be interesting opportunities to use such highly figured plywood in relatively small units, such as an "eye catching" central motif with more moderately figured plywood as a background or for bordering effects. Hence most interior plywood is made of "long wood," in the veneer terminology, where flitches are sliced in 12 and 16 foot lengths.

Most interior plywood is matched for color and grain, while a limited amount is book-matched for figure to give symmetry. More intricate matching is seldom employed.

Present day trends in modern design favor the use of smooth expanses of walls, from the floor to the ceiling, requiring plywood lengths of 8 feet or more. Many items of functional equipment are built-in for drawers, closets and the like, as can be noted in the diversity of interior views that are illustrated. Both hardwood and softwood plywood are employed. In the case of Douglas fir plywood, the grain figure is often emphasized by irregular grooving to permit the figure to stand out in bold relief and thus to provide interesting shadow effects.

Knotty Pine plywood breaks up the monotony of plane surfaces and is a variant to the grain figure in hardwoods. An example is illustrated in Fig. 1, where the walls and equipment are all built to harmonize. Sliding doors, also of knotty pine, can be noted at the right of the photograph. The ping pong table, in the front center is Masonite hardwood glued on a fir plywood table top.

Another attractive use of knotty pine plywood walls is shown in Fig. 2, in which the double sliding doors are of birch; the set-in drawer cabinet is of bleached mahogany; the desk is also of mahogany, finished dark. The floor

Fig. 1. Playroom with knotty pine plywood walls and cabinets.

is of solid plain sawn oak with a golden finish. The veneered mosaic map of the United States, hung over the desk, is a fine example of exquisite workmanship in plywood marquetry.

The corner of a recreation room, shown in Fig. 3, indicates the attractive use of a pleasingly figured plywood, imported Samara, made in South Africa at the mill of the United States Plywood Corporation. This plywood is in the moderate cost ranges. The wide variations in grain figure give an interesting over-all effect.

The plywood enclosure of the column, at the rear center, is attached by extruded metal moldings, faced with veneer. The contours of the external and internal corners are varied to provide a firm grip on the vertical edges of the plywood. The external corner molding extends out sufficiently to guard the adjacent plywood against injury.

Fig. 2. Den of knotty pine plywood, with other contrasting species.

The music room, illustrated in Fig. 4, provides a pleasing contrast between the matched striped walnut on the wall and the blond Korina plywood, of which the music cabinet is made. This wall paneling is installed with a recently developed dry bonding contact cement. An interval of 20 to 30 minutes after spreading permits the plywood to be pressed in place, and no heat is required to make a strong and permanent bond. All fitting must be carefully done in advance, as the grip of the cement is immediate, and no subsequent shifting is possible without damage to the plywood. This cement entirely eliminates the use of screws and nails for attachment and is equally applicable to masonry walls. The entire absence of mechanical fastenings adds to the beauty of the smooth walls.

An interesting development in northern grown birch with natural finish is shown in Fig. 5. The plywood for these drawers and doors has a lumber core,

Fig. 3. Recreation room of Samara plywood.

railed with birch, so that the molded edges will harmonize with the face veneers and the intermediate birch door stiles. The doors above the "Thermador" are matched in pairs, so far as matching is possible in rotary cut veneer. The large entrance door at the left is an interesting example of one piece curly birch veneer.

The wall paneling illustrated in Fig. 6, is of a special type, called "Plankweld," which is particularly designed for the "do-it-yourself" trade. Both edges of the plywood are grooved and interlock as they are erected, by the method shown in the sketch of Fig. 7. Here panel "A" is firmly fastened in place by a series of metal clips, "C," which are nailed to the studding, "D." These clips are 12" to 15" apart and hold the lower lip of panel "A" rigidly against the studding, "D." The lower lip of panel "B" is fitted into the groove of panel "A," covering and completely concealing the series of metal clips. These Plankweld units come in lengths of 8'-0", and widths of 16¼", so as to correspond to the conventional spacing of studding, which is on 16" centers. The overlapping lip accentuates the joint and is a pleasing interruption to the otherwise monotonously smooth surface. The Plankweld shown in Fig. 6 is plywood of Honduras mahogany, with a grain figure derived from slicing the bole of the tree trunk next above the stump. The taper of this part of the trunk reveals the loops of the successive growth rings as the diameter decreases.

Fig. 5. Kitchen cabinets in birch plywood.

Fig. 4. Den with walnut wall paneling and music unit of Korina plywood.

The photograph of Fig. 8 shows an all wood interior in a bedroom, ceiling and walls of birch plywood and floor of solid plain sawn oak. The wall, of book-matched curly birch, which was sliced for accurate matching, is particularly attractive, and extends into

Fig. 6. Wall of Plankweld plywood.

the next room, as can be seen through the open door. The double sliding doors to the wardrobe are of less highly figured birch veneer, rotary cut and approximately matched. That properly made plywood will not warp appreciably is demonstrated by these sliding doors, which are hung from above and must not scrape on each other whenever the doors are opened. The fronts of the built-in set of drawers are cut down from a single larger panel and the figure is continuous from the floor to the doors at the top. The ceiling with its central skylight, is laid in parquet squares with "V" grooves at the joints. Reversing the grain direction of the alternate squares produces attractive color contrasts. The entrance door, shown open, is also of the plainer

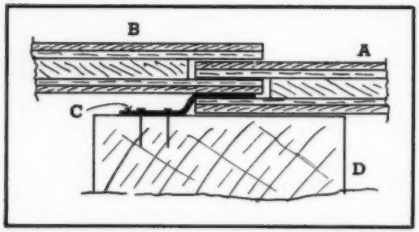

Fig. 7. Enlarged horizontal section of Plankweld joint.

Fig. 8. Bedroom with complete wood interior.

figured birch veneer, similar to the wardrobe doors and the built-in cabinet fronts.

The bar in the playroom, illustrated in Fig. 9, is of Philippine mahogany in Plankweld design, the details of which are shown in Fig. 7. The overlapping joints can be clearly seen at the far right, as well as on the front of the counter.

The living room in Fig. 10, has plain sliced oak in the wall panels, and rift oak in the ceiling, both sliced veneer and erected with "V" joints. The figure in this oak plywood is particularly attractive with the "eye" effects be-

Fig. 9. Playroom of Philippine mahogany plywood in Plankweld design.

Fig. 10. Living room with sliced oak plywood on walls and ceiling.

Fig. 11. Douglas fir plywood with Driftwood texture.

tween the bookcase and picture at the far right of the photo. The rift oak, in the ceiling, sliced on an angle, has a much more subdued figure than the wall panels.

The rather "wild" grain figure, often characteristic of Douglas fir, can be developed into some unusual and interesting effects by sand blasting away the softer portions and leaving the more dense areas in bold relief, as is shown in Fig. 11. This is a special development of the United States Plywood Corporation called "Surfwood," and is textured to resemble sea washed driftwood. (There are other plywood manufacturers who have this same material, but called by other trade names.)

Another type of textured surface in Douglas fir plywood has been originated by the same company, and is called "Weldtex." In this development the grooves are parallel, but varying sizes, again providing interesting shadow effects. The photograph in Fig. 12 shows a ceiling made of "Weldtex" squares, laid in a checkerboard pattern, and offering a welcome relief from the conventionally smooth ceilings. These grooves are mechanically cut and such plywood is offered in full sheets with the grooves in either direction, or in smaller squares.

Fig. 12. Ceiling of Weldtex squares.

Fig. 13. Weldtex plywood walls with cross bands.

Still a different type of installation of "Weldtex" in walls and for a bar front, is illustrated in Fig. 13. Several designs are included in this photograph. The wall at the left and above the bar has long horizontal bands of "Weldtex" with shorter vertically grooved plywood between the bands. At the right background the plywood is vertically grooved from the ceiling down to a horizontal base band near the floor. The front of the bar is all vertically grooved. The bar top has a Micarta surface and a curved edge band all glued to a plywood base.

This grooved plywood lends itself readily to a number of varying designs.

Conclusions

Plywood walls and ceilings are rapidly gaining in popularity. Several of the types of plywood illustrated are in the low cost ranges and can easily be erected by a home owner who is handy with tools. In such event, it is important that the studding be spaced evenly and well lined up.

Plywood interiors have insulating values against sound and temperature, are easily kept clean, and rarely require refinishing. Wood is always decorative and has a warmth of feeling in any home. Its growing popularity has been well earned.

Plywood seen in figures 2, 5, 8 and 10, is by the Aetna Plywood & Veneer Company. Other pictures show plywood manufactured by the U. S. Plywood Company.

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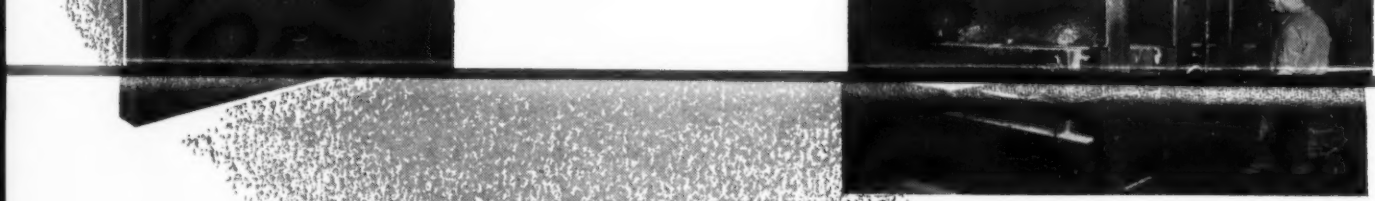

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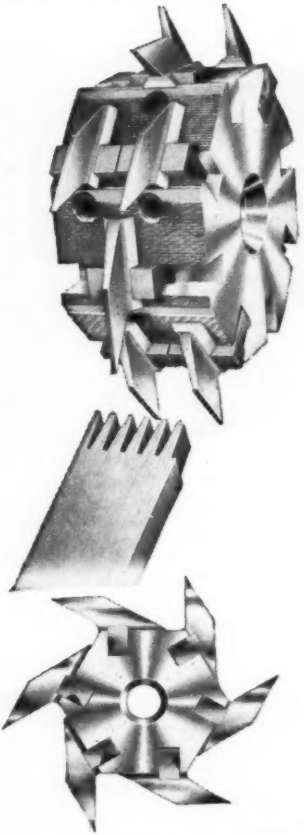

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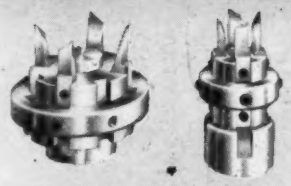

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The Story of AIRCOMB

By James Joseph

ONE of woodworking's new structural materials borrows its design—and concept—from one of the oldest, most construction-wise of insects: the bee.

We're talking, of course about honeycomb paneling, its paper or fabric core impregnated with phenolic resins and sandwiched between any of numerous facings, including plywood, veneers, aluminum, stainless steel or magnesium.

Honey comb core fits its name: it's of cellular construction. Yet dimensionally it's held to close tolerances, plus-minus .010 thicknesses becoming "standard".

Where, for an EI rigidity factor of 792,000, steel might weigh 12-lbs./sq.ft. and birch plywood 3.26-lbs./sq.ft., a honeycomb-cored panel would likely weigh only slightly more than .7-lb./sq.ft.

This is reason enough why, despite some higher costs (80-300% the price of comparable-strength materials), honeycomb sandwich paneling is finding increasing use by woodworkers.

For woodworkers, honeycomb panels offer a phenomenally high strength-to-weight material which is (1) fire, fungus and pest resistant; (2) unaffected by temperature extremes in the -65/plus 250 degrees F. range; (3) an excellent insulator and sound-absorber; (4) a product of high compression and shear strengths.

History of Honeycomb

Honeycomb structures got their start in the aircraft industry (where weight means everything). So it's natural that among the newest, most closely-toleranced and strongest is Douglas Aircraft Co.'s "Aircomb," a phenolic-resin impregnated kraft paper core which its makers claim is industry's strongest material in relation to weight.

"Aircomb" looks, feels, cuts and behaves like wood—but isn't. It can be sawed, shaped, sanded—to tolerances of plus-minus .003-inch. Two cores may be spliced without reducing strength.

Although some say honeycomb coring is "special purpose" (advantageous only where weight counts more than cost), a recent survey indicates the use-production of 6,000,000 bd.ft. annually by 1960, compared to the current 1,250,-000 bd.ft. Many honeycomb manufacturers believe the 1960 estimate much too conservative.

Panel makers believe honeycomb's future assured. They base this belief on the fact that (1) honeycomb is finding its way into pleasure-boat construction—i.e., the inherent flotation of a honeycombed bottom eliminates need for air tanks; (2) internally reinforced panels require no supporting members —no columns, studs, etc.; (3) honeycomb coring lets the woodworking face panels with very thin veneers of expensive woods; (4) the panel's average 50% weight reduction means that a manufacturer at one end of the nation can deliver his product—and successfully compete—in markets at the other end.

Sonic testing. The panel is placed on a baffle box installed with audio speakers. Sand is sprinkled on panel. Noise vibrates the sand, reveals flaws in panel bonding.

Honeycomb can be spliced easily. Here is splicing station at Douglas. Knife in foreground is used to cut ends of honeycomb. Then, the blankets are overlapped and pressed together by hydraulic cylinder, background.

Typically, "Aircomb" is currently used by an eastern desk-maker—reducing product weight enough to compete in the western market. In aircraft, every 200 lbs. sliced from a plane's weight allows another passenger to ride. Figured over an airliner's average 10-year life-span, this amounts to a tremendous increase in payload (thus, in Douglas' DC-6 and DC-7, you'll find partitions, floor panels (in the cockpit), tables, ceilings, interior doors (because properly-faced honeycomb panels don't warp) and baggage racks "Aircomb" cored).

Advantages of Honeycomb

Another big boost for honeycomb: it combines strength with inherent insulation properties. Claims Douglas: a 3½" thick panel of "Aircomb" faced with .020" aluminum has a thermal conductivity "U" value of .06. Thus, in this thickness, the panel is (1) more than 8 times better an insulator than an 8" thick brick wall; (2) has 6 times the insulation of a 12" thick concrete wall; (3) 5 times better than a typical residential frame wall with stucco outside, metal lath and plaster inside.

On top of this, "Aircomb's" insulation value may be upped 100% by adding any of several "foam" insulators to the cells during manufacture. "Foaming" fills cells with an insulating material.

Honeycomb sandwich utilization is growing: a fabricator of filling stations sandwiches "Aircomb" between porcelain enameled steel facings—simultaneously forming both interior and exterior walls. Non-warping honeycomb panels are being fitted as doors and partitions. They're being used to construct truck trailers and waterproof radar vans. They're employed as floor, roof and wall panels for prefab homes, as drafting boards, as lightweight holding fixtures so women workers, who legally can't lift more than say 25 lbs. can move fixtures without manpower.

Douglas, as an outgrowth of its airframe program, has become a primary fabricator of honeycomb core material. While the company makes some complete panels, these go mostly into its own planes and into some special pro-

Core material cuts and sands like wood. Here's sawing-sanding section at the Douglas, Bell, Calif., plant, illustrating how core material is cut and sanded to close tolerance.

Out of bonding press—seams in the newly formed blanket illustrate how narrow, short runs of honeycomb are bonded together to form blankets of almost any size or shape. Material is very lightweight.

jects, mostly governmental. Primarily, Douglas manufactures honeycomb, selling it to woodworkers and fabricators who apply a wide variety of facing materials, everything from Fiberglas laminates to plywood.

Manufacture of Aircomb

Using "Aircomb" as an example, let's follow its manufacture, observing sandwiching methods, with emphasis on face materials common to woodworking.

Aircomb begins as either 60 lb. or 125 lb., 18" wide kraft paper. Six hundred fifty pound rolls of long fiber kraft (from northern pine) arrive at Douglas' Aircomb plant in Bell, Calif. Rolls are first run through a glue-line (or "node line") applicator. Like many in the plant, the machine is Douglas-designed. A phenolic, water-soluble, thermosetting resin (perhaps Amberlite PR-14) is applied in .125" wide, .007" thick lines both sides of the paper. Nineteen lines are laid down on the "front" surface; 18 on the "back". Lines are staggered—i.e., a node line on the reverse side falling between two lines on the front.

From lining, kraft passes through a 150° F. dryer (sufficient to evaporate the water but not hot enough to cure the resined lines). Next, the kraft passes a cutter whose heads slit the roll laterally into 3.2" to 6.4" folds (thus determining the thickness of the honeycomb core). Since slitters leave uncut a portion of the fold line, the roll remains continuous, although automatic folding produces a kind of fan (resembling a stack of paper towels, each attached to the next).

Then comes the curing, when the folded kraft is batched into carts, rolled into an automatic humidity-adjusting high frequency dielectric oven (an 8-minute cycle at 100 p.s.i., and 300° F.). Curing bonds the resin lines, producing a compressed (yet fan-like) honeycomb unit. At this point, the future core structure is anywhere from 3.2" to 6.4" thick, although Douglas eventually saws the core to thicknesses ranging from .070" to 6".

Adding the "Honeycomb" Look

One additional step is necessary be-

Nike fin cores ride holding jigs as they pass into first of three integrated saw-sander rigs. These contour cores to Nike fin requirements.

fore the compressed structure takes on the honeycomb look. That step: expanding. Involved is a manual operation, although Douglas has some hydraulic expanding equipment newly installed. Two operators, using hooks, grasp either end of the compressed core and stretch it into a magnesium form which may be 20′ or 40′ long. Released, the honeycomb core fits the form snugly. Since the form's 14.4″ wide, compared to the compressed core's original 18, that's the new core width. Still in its form, the core is dipped into a resin tank, agitated (2 minutes at 70° F.) and after another 2 minutes of automatic shaking to be rid of excessive resin, the form enters an 85′ oven.

During the first 40′ of oven travel, the core is cooled by a forced cold-air blower, driving alcohol from the resin. A successive 25′ section subjects the core to 150° F., forced hot air, assuring complete alcoholic evaporation. And finally, the core enters a 20′ curing section where temperatures are held to 300° F. Over-all oven cycle varies from 12 to 18 minutes.

Interesting is the fact that the 60 pound kraft, when its glue lines are bonded, has an expansion ratio of 40:1, while the 125 pound paper has a 20:1 ratio. Thus, 12″ of unexpanded core in the 125 pound material expands, during stretching, to 20′.

The result of these manufacturing steps is a phenolic resin impregnated kraft honeycomb core which, after five days warehousing (so temperature and moisture absorption is normal), is cut, sanded and shipped to fabricators.

Three saw-sander stations where core material is angled to very close tolerance for the Nike fin. Note the three saw-sanding stations, each cuts different angle in the core material.

Panels begin with one side panel inserted, then a pre-cut honeycomb blanket, often slightly oversize for a snug fit. All surfaces have been sprayed with phenolic resin.

Every fifth core (as they come from the curing oven) is compression-tested for 400 p.s.i.

At present, Douglas' "mill run" core —the average product from its Aircomb line—is guaranteed with a standard thickness tolerance of plus-minus .010". Standard lengths are random 8'-9' with a 10% premium charge for exact lengths or for lengths shorter than 8'.

Even before it has been faced, "Aircomb" cuts like wood. Douglas uses a standard, vertical bandsaw—either an Oliver or DoAll. A ½" 6-tooth skip blade has been found best for cutting 60 lb. kraft core; and a ¾" 4-tooth skip blade for the 125 lb. While thicknesses of plus-minus .010" are "standard," cores are often finished to tolerances of plus-minus .002-.003", although such tolerances are more expensive due to the higher rejection rate.

A soft rubber drive-roll (working from a Graham vari-speed motor, 0-30 ft./min.) operates on an air cylinder, pressing the honeycomb against the saw's backplate. Usually the core is sawed slightly on the plus side, then sanded to tolerance. The sander is standard, using 60 grit paper, sanding both sides simultaneously at a 15-ft./min. rate. The sawed-sanded core, in various lengths, is compression-tested—and ready for shipment.

Panel Utilization's

Douglas, as we've said, does make some panels for its own use and on special order (government contracts, for instance). Thus, it uses an "Aircomb" sandwich for the fin construction of its "Nike" guided missile. This core is unusual in that it's sawed with three angles to contour with the aluminum facing. Involved is a continuous belt with three band saws spaced along its length. Each saw and its integrated sander cuts a different angle. Saws, incidentally, operate horizontally, the angles being in the low order of 2 to 3 degrees.

The "Aircomb" division has faced cores with almost every type of wood and, of course, with other faces, from Fiberglas laminates to steel.

Consider one application. The baggage racks in DC-6s were formerly made from 5-ply (aircraft grade), in 9' to

Edging is fitted to a core as it passes into bonding oven.

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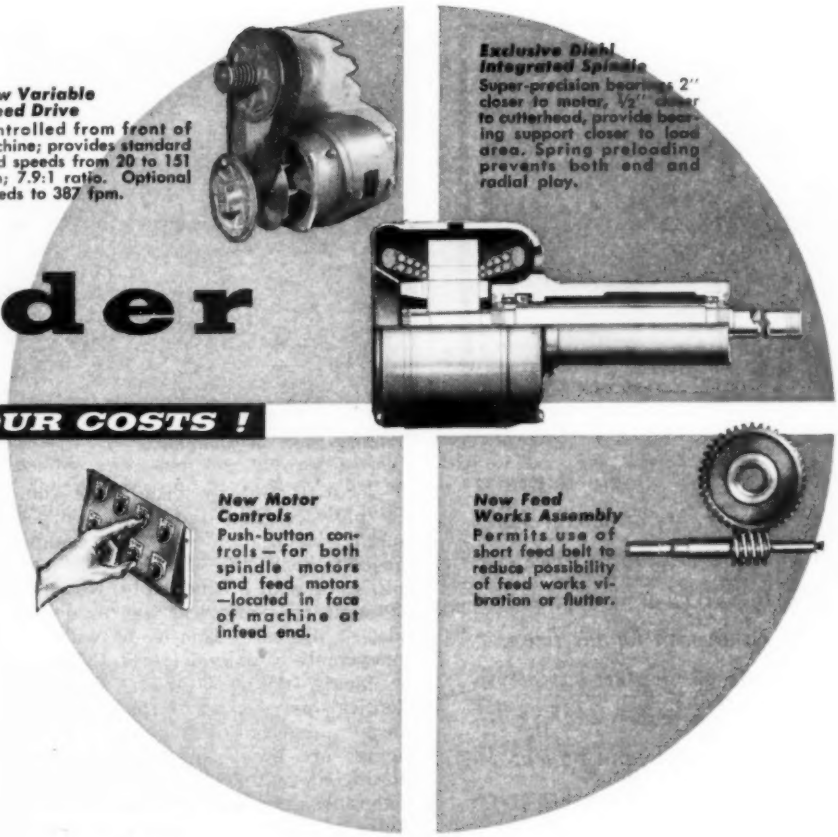
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Bonding oven at Douglas.

10′ sections. But by installation time, the plywood had too often warped, making installation difficult. Douglas turned to "Aircomb," facing a .090" core both sides with 3/32nd 3-ply. Note that the same type of wood was used both sides of the core. This is—as with any honeycomb— vitally important. So long as facing materials—both sides—are identical, panel can't warp. But it will warp—and go out of shape— if different facings are used. Now, with warpage eliminated (and weight reduced), baggage racks are precision installed, saving hours of labor and giving a neater, stronger job.

Douglas has tried almost every bonding resin available for exterior panels, although the company favors hot-bonding resins. Examples: Chrysler 55-9, U. S. Plywood Hot Bond 120, Lebec 102756, Minnesota Mining & Mfg's EC1177. For interior panels, where a cold-setting, medium strength resin is permissible, Douglas has, among others, used Urac 185, Lauxite RF-901, Weldwood 202 and Penacolite G1260. Douglas' preference for hot-bonding-pressure resins stems from production requirements: cold-resins must be kept under pressure anywhere from 24-36 hours, necessitating more warehouse

Bonding oven and the finished results. A honeycomb cored panel is sheathed in aluminum. It could also have been covered in wood or plastic.

area than Douglas currently has available.

First, let's see how Douglas (and your own shop or plant) could handle the honeycomb core.

A honeycomb blanket—material wide and unrestricted as to length—is made by bonding together, under heat and pressure, any number of core sections. Mating edges of the honeycomb are sprayed (using a paint-sprayer) with a phenolic adhesive. Edges are held at contact pressure in a 300° F. oven for 18-20 minutes. While the adhesive isn't at this point completely cured, it's firm enough for the panel to be worked.

Working with Honeycomb

Honeycomb can be spliced—a relatively simple job. Two pieces are cut with a large, manually-operated drop blade. The edges are overlapped about 1½" (that is, one piece of honeycomb is lapped and placed atop the other.) At this point, a plate, fixed to an 8" air-actuated hydraulic cylinder, presses the overlapping cores together (200 p.s.i.) and they're mated—and as strong

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as the non-spliced areas. No bonding resin is required, though it could be used if desired.

The finished 125 pound kraft core weighs 3.6 lbs./cu.ft.; the 60 pound 1.7 lbs./cu.ft.

Bonding faces onto the core follows the same general technique: first, both core surfaces (top and bottom) are sprayed with a phenolic adhesive, applying about .1 to .112 lbs. per sq.ft. of panel. Adhesive thickness, while fairly critical, is actually regulated by the speed of the conveyor through the adhesive-application booth, where two spray gun operators stand, on either side of the belt. Belt speed approximates 10-ft./min.

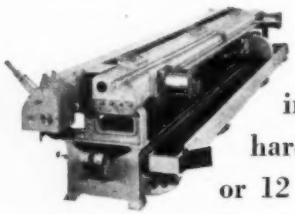
However, the thickness of adhesive sprayed onto the cores surfaces prior to bonding varies. In one Aircomb application, the honeycomb gets about .015" over-all while the facing (aluminum or wood) gets .007".

With both the facings sprayed (on their bonding sides only) and the core sprayed both sides, the panel goes to a bonding press. The cycle is usually 25 minutes. During the first five minutes, panel is held at contact pressure, but under 300° F. During the next 20 minutes, pressure is increased to 20 p.s.i., under the same temperature. And the panel's ready for wood finishing.

This example is the simplest type—a panel bonded with facing plates, but with edges left unfinished.

Usually, the edges are bonded with plates. There are many types of edgings, including built-up edge, preformed edge, extruded channel, wood strip edging and an edge fabricated from flange. There are also a number of possible panel inserts, depending upon application. Thus, there's the wood block insert, the hat section and plastic insert.

More often, panels are built up in



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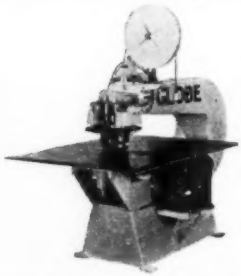

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GLOBE Machine Manufacturing Co., Inc.
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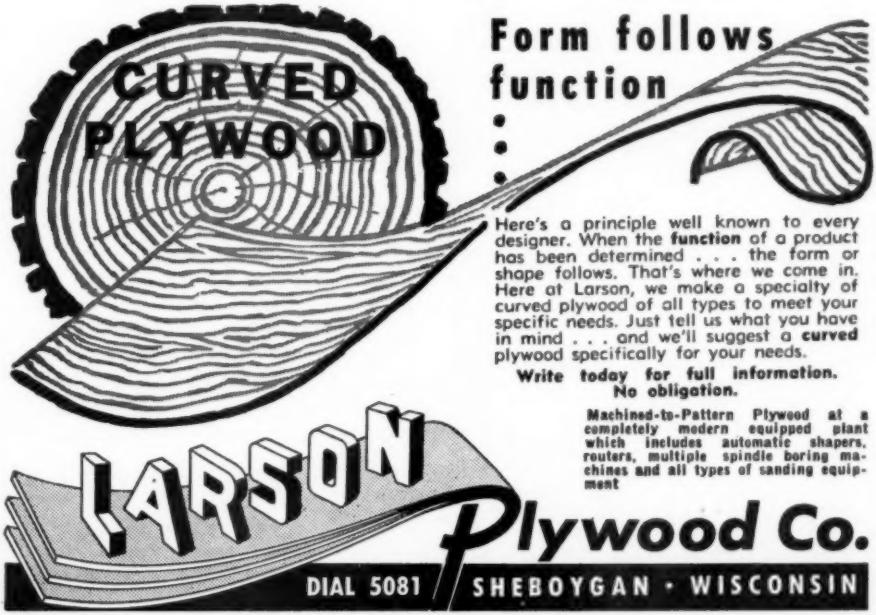
a form, called a "bonding jig." First, the bottom sheet (wood, aluminum, etc.) is placed and sprayed. Next, edge angles are inserted, these preformed and sprayed with adhesive. After this, the honeycomb blanket is fitted into the form, often with the help of "shoehorns" so the core, purposely made slightly oversize, fits the form's contours snugly. Finally, the top facing is placed, having previously been sprayed with resin adhesive. Then the form routes to the bonding press for the 25 minute bonding cycle.

Importantly, if faces are metallic—that is, conductive materials—their edges are either fabricated from wood or plastic, or at least a space is left (later to be sealed) so that the two facings are not connected. If they were, the panel's inherent insulating value would be destroyed.

This, then, is the general picture of honeycomb core manufacture—how the core is fabricated, how face plates are bonded—and the many applications currently in use or on the drawing board.

Bond Inspection

One more item is noteworthy: method for inspecting the panel's internal bond. The panel is set on a table in a sound-proofed room— a room dominated by twin 4' x 6' audio speakers. Sand is sifted over panel surfaces. Then, an inspector, operating from a sound-proof booth over the panel, tunes an audio oscillator through the audio range. Frequency vibration affects the bonded portions of the face plate differently than the unbonded. The sand—after about a minute's time—shifts off and away from unbonded areas, showing their exact outlines. The test applies only to completely unbonded areas. It will not indicate a poor or weak bond. With one side checked, panel is turned and an identical sound test run.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HARDWOOD PLYWOOD INSTITUTE

The institute held its eleventh annual meeting on February 8 at Chicago. Officers elected are: Don E. Nichols, president; Robert Beggs, vice-president and Charles E. Close, managing director.

George Lester (left) is succeeded as H.P.I. president by Don E. Nichols.

Robert Hawes, counsel for the institute, asserted that imported hardwood plywoods in the third quarter of 1954 supplied 41.1% of the American market as compared with 8.9% for the year 1951, when tariff rates were cut for the second time in two years. The institute has applied to the Tariff Commission for action under the "escape clause" of the Trade Agreements Act. Hearings have been set for March 22.

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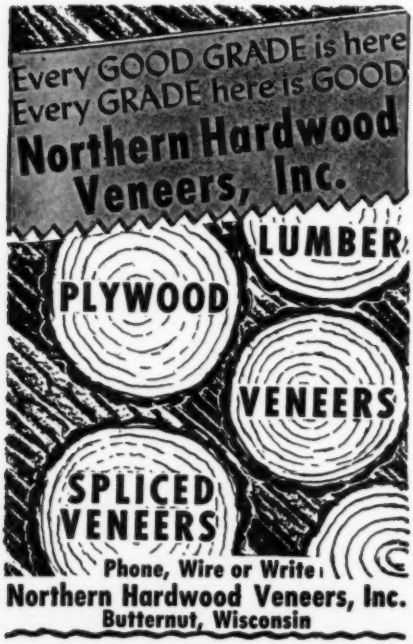
Joe Lerner has organized the Lerner Plywood Company, 14241 Schaefer Highway, Detroit, Mich., to serve the metropolitan Detroit and trading area surrounding Detroit. The company will handle both carload and LCL business.

Husband (after an airplane trip): "As I contemplated the wonders of nature from high in the sky, I realized how insignificant man is."

Wife: "Humph, a woman can see that without going up in any plane."



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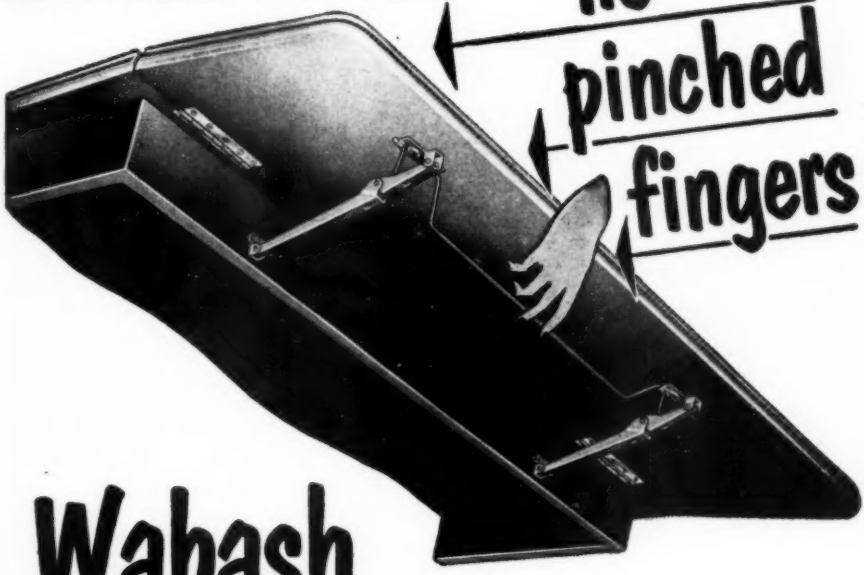

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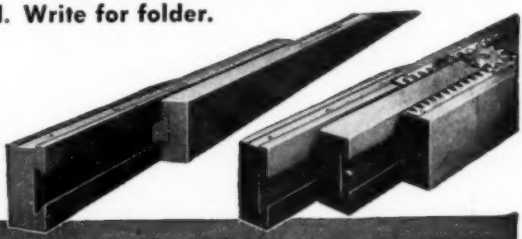

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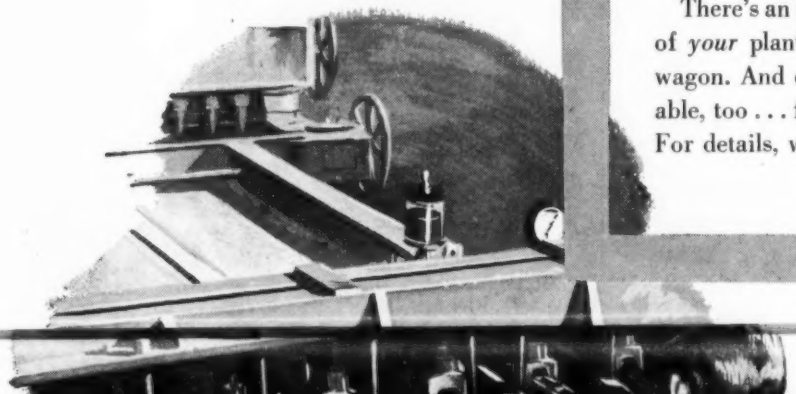

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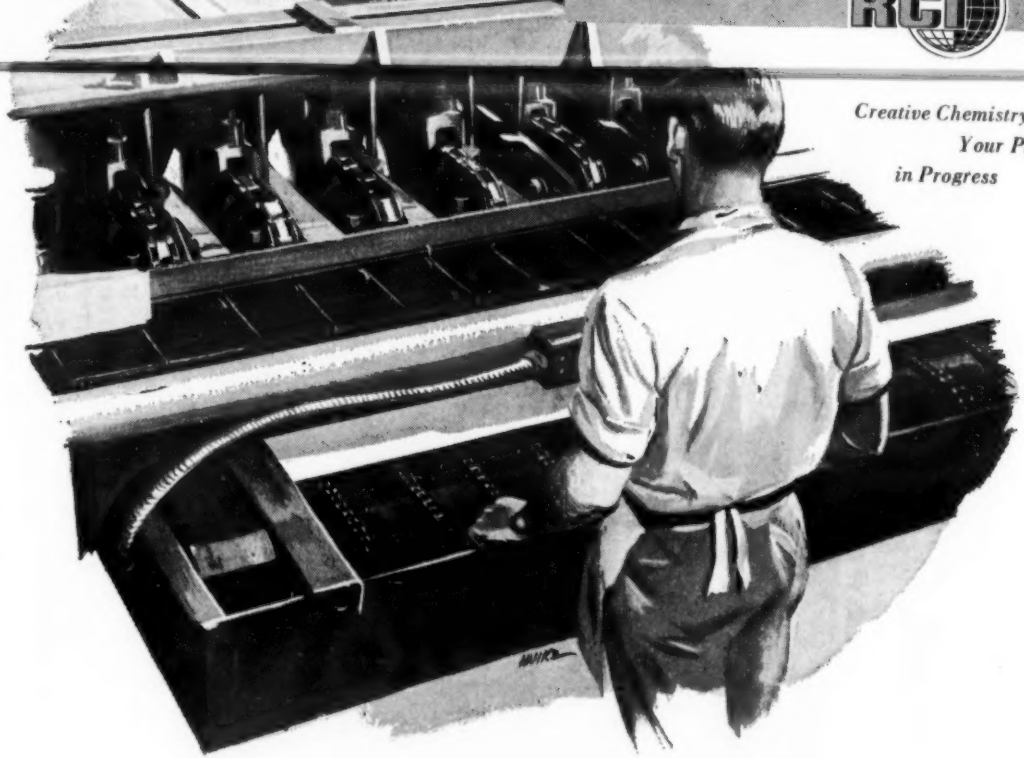

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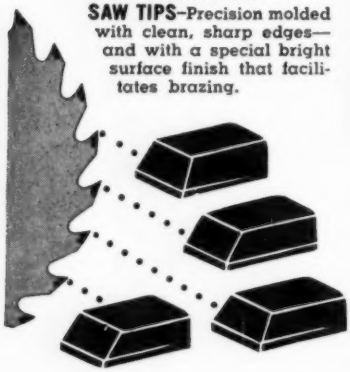

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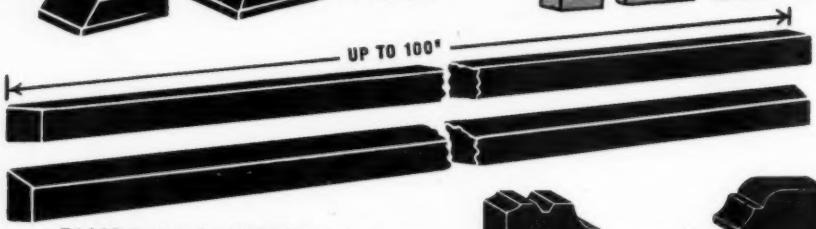

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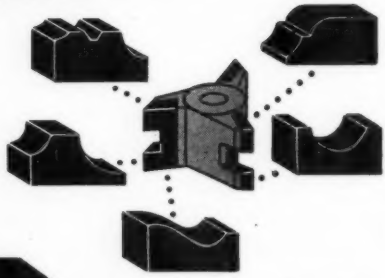

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TALIDE ROTARY CUTTER BLANKS
Preformed to accurate tolerance with minimum stock—and to any form or shape desired.

New Literature

LUMBER HOIST BOOKLET

B. M. Root Co., York, Pa. has a booklet available on the firm's style HA lumber hoist. The four-page brochure describes this hoist which can be used wherever lumber in kiln load lots must be handled. Its major use is in the rough end mill at the cutoff saw, although it is frequently used at the planer or ripper. The standard hoist is furnished in 8, 12 and 15 ton capacities.

FIR PLYWOOD STANDARDS

Western fir plywood manufacturers have stiffened the U. S. commercial standard covering the performance requirements and appearance quality of their product. The changes are contained in U. S. Commercial Standard

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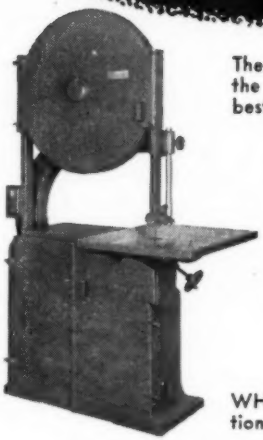
36 In. BAND SAW



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CS45-55 promulgated by the industry through the National Bureau of Standards. This supersedes CS45-48.

The standard affects annual production of about four billion feet, accounting for about 75% of the nation's total plywood output.

A printed copy of the complete standard is available without charge from the Douglas Fir Plywood Association, Tacoma 2, Wash.

MOLDER CATALOG

A complete new catalog on electro-unit drive molders is now available from Dependable Machine Company, Inc., Greensboro, N. C., manufacturer of these machines.

The 12-page catalog gives complete information, specifications, and pictures of the M-144 (4"), M-146 (6"), M-148 (8"), and the M-150 (10") standard models and the 4", 6", 8", and 10" random length hopper feed models.

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SAVE TIME
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You save cutter expense and time with ONSRUD carbide router bits—because you buy fewer bits and stop for sharpening less frequently. For hard or abrasive materials, synthetics, plastics and metals, these cutters are the last word. They often fill the bill where all others fail. The grade of carbide used in these bits is of proven quality, tough as well as hard to withstand the shock and vibration incidental to hand fed routing.
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Onsrud Cutter Manufacturing Co.
801-21 E. Broadway Libertyville, Ill.

WOOD HOG BULLETIN

A 4-page bulletin, describing the American swing-hammer hogs and shredders, has been released by the American Pulverizer Company, 1249 Macklind Ave., St. Louis, Mo.

The literature lists and describes "a size for every operation, and a type for every material." Included is a discussion of design advantages for the uniform reduction of wood scrap for boiler fuel, also the reduction of other types of fibrous materials for extraction and processing purposes.

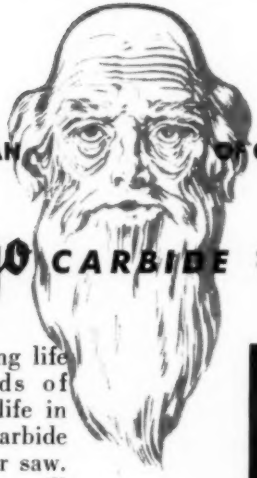
SCREW GUIDE

A package stock guide on wood screws, Phillips and slotted screws has been issued by the Southern Screw Co., P. O. Box 1360, Statesville, N.C.

Over 300,000 gross of wood screws in package stock and 600,000 wood screws ready for immediate packaging from bulk stock are classified as follows: (1)

THE METHUSELAH OF CIRCULAR SAWS

Chicago CARBIDE TIPPED



Not just a long life but hundreds of times longer life in a Chicago carbide tipped circular saw. Your customer will be convinced of the performance dividends these saws will pay them. Write for catalog and price list showing complete line of plain and carbide tipped saws.

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A full line of carbide tipped blades including: Rip, Cutoff, Combination, 8-tooth Power Saw, and Planer in standard gauges and sizes.

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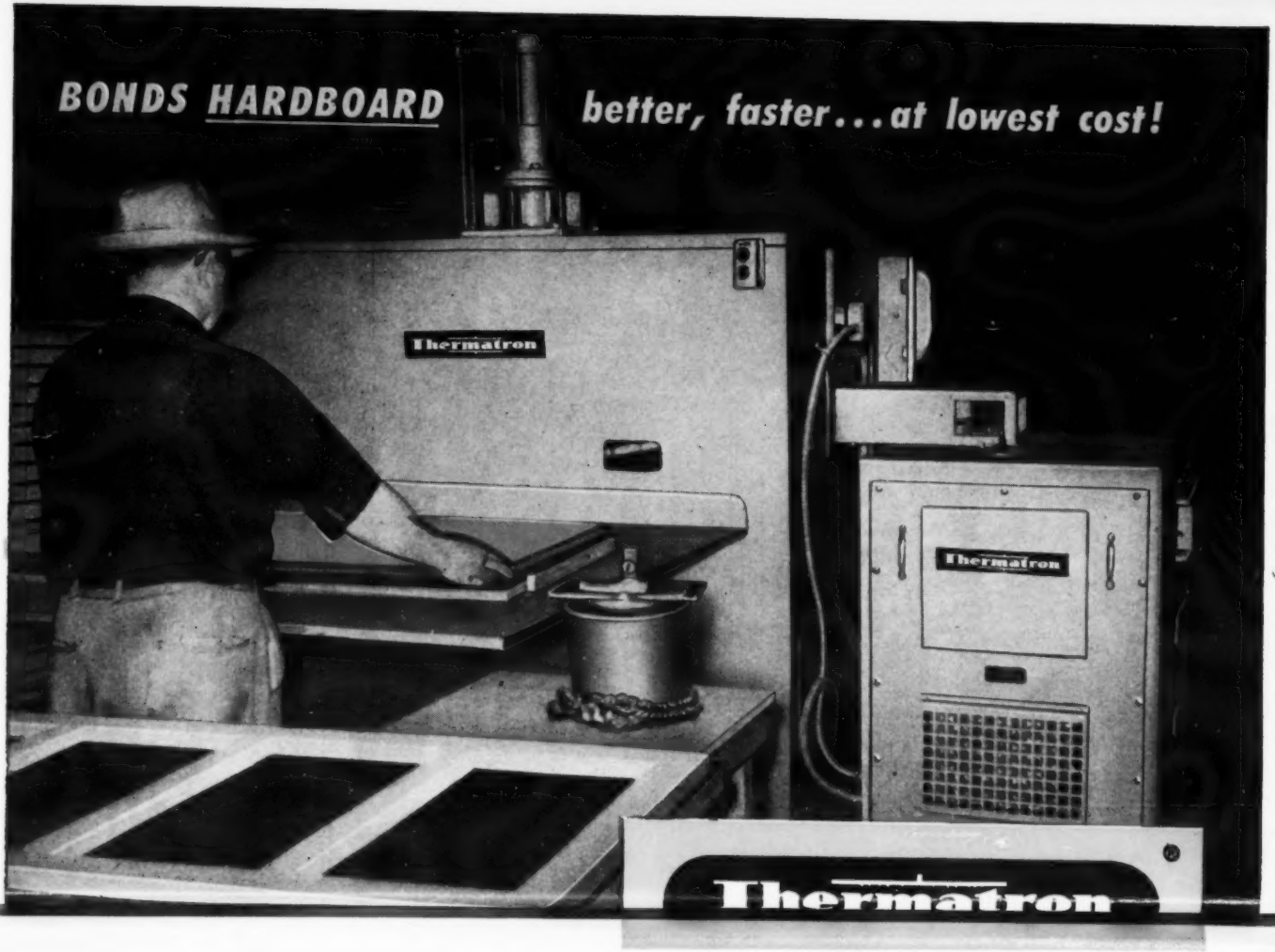
slotted steel; (2) slotted brass; (3) Phillips steel; (4) Phillips brass; (5) slotted silicon bronze and (6) slotted aluminum.

HUMIDITY CONTROL

The Bahnson Co., 1001 S. Marshall St., Winston-Salem, N.C., has recently revised and enlarged the booklet "Humidity Control in the Woodworking Industry." This booklet gives comprehensive coverage to the subject and is very well illustrated.

First, an explanation is given as to why there are humidity problems and then methods of control. The Bahnson equipment is completely described and a partial list of recent applications given.

The book is one of the best on this subject. It is easily understood and the illustrations cover all of the Bahnson equipment.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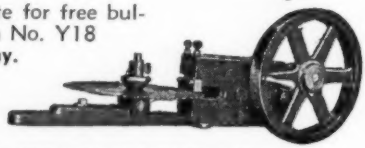

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- Gluers, electronic
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- Lumber
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- Machines, door and sash
- Machines, dovetailing
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- Machines, gluing
- Machines, mortising
- Machines, nailing
- Machines, sawmill
- Machines, saw setting
- Machines, screw driving
- Machines, stapling
- Matchers
- Moisture Meters
- Mortise chains
- Moulders
- Nails
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- Paint
- Planers
- Planes
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- Presses, plywood
- Putty
- Reamers, hand
- Rippers
- Routers
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- Sanders, automatic strake
- Sanders, belt
- Sanders, contour
- Sanders, disc
- Sanders, drum
- Sanders, endless bed
- Sanders, portable electric
- Sanders, special
- Sanders, variety
- Sandpaper
- Saws, arbor
- Saws, band
- Saws, chain
- Saws, cross-cut
- Saws, cut-off
- Saws, gang
- Saws, portable electric
- Saws, radial
- Saws, rip
- Saw blades, band
- Saw blades, carbide
- Saw blades, circular
- Saw Guides
- Screws
- Shapers
- Shaper Collars
- Spray Equipment
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- Surfacers
- Tackers
- Tenoners
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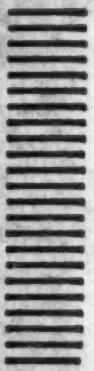

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Nailing Machine Operations in TV Cabinet Manufacture

Indiana is said to be the center of of TV cabinet manufacturing. It is reported that the combined output of just 10 plants in this state is more than 9,000 cabinets a day. In order to keep these high production figures, manufacturers have taken advantage of every possible short-cut. This article is a report on the outlook for the future of cabinet manufacture and a summary of operations in which nailing machines are used.

Future

Ten plants are included in this survey and all of them are optimistic about 1955 though, in some cases, it is a "reserved optimism." The aim for each manufacturer is to meet competition with quality cabinets at a lower cost and thus receive a share in the big TV market.

Materials Used

One of the questions in the survey stressed the material being used in TV cabinet manufacture. Of the plants surveyed; four were using compressed wood almost exclusively for paneling; two were using plywood exclusively; and four used compressed wood and plywood in equal amounts. Metal was used in some cases for table models.

Trends

Another question asked of each manufacturer was whether there is a trend toward the use of any one material, above all others, in the manufacture of TV cabinets. Eight of those interviewed felt that compressed wood will continue to gain in popularity. Plywood will continue to be used by all manufacturers now using it and particularly for the more expensive models. Only one manufacturer thought that metal would grow in popularity and, if so, would be used for the cheapest table models.

Nailing Operations

Here is a summary of the ways in which nailing machines—Auto-Nailers made by the Auto-Nailer Co., 267 Marietta St., N.W., Atlanta 3, Ga.—are being used. Every plant interviewed had at least one of the machines in operation and was using them as follows:

1. To nail a cleat onto a baffle board and to glue-nail a cleat onto a small panel. (Glue-nailing is a process by which glue is applied to the members

Spartan model Auto-Nailer glue-nailing a rim onto plywood for a TV cabinet. This same machine is used to perform many other jobs at this plant including making skids on which the finished TV sets will be shipped.

Three Crusader model Auto-Nailers glue nailing ¾" cleats to plywood panels for TV cabinets.

Banding TV cabinet tops with Auto-Nailer.

Spartan model Auto-Nailer glue-nailing cleats to TV cabinet front panel. The nails are driven through the cleats and into the panel, but not through the outside veneer. In this way no holes are made in the outside panel.

which are to be nailed. During the nailing cycle the members are squeezed under controlled pressure. Since the auto-nails sustain this pressure, the stock can be handled and worked while the glue is setting.)

2. To make skids for consoles.

3. To glue-nail bands, cleats to plywood panels, rims to panels and to attach modeling.

4. Auto-Nailers are sometimes used as stand-bys in case of a breakdown of the high-frequency gluers. Should this happen, the Auto-Nailers are used to glue-nail cleats onto cabinet panels.

5. To spur the cleats and panels, preparatory to putting them into the high-frequency gluer, to preclude shifting.

6. Auto-nailing grill bars (lattice assembly which is installed outside the speaker silk).

7. Auto-nailing a glass rail (into which the protector glass for the picture tube is fitted) onto a shelf rail.

8. To glue-nail a cleat to a plywood knob panel.

9. To glue-nail cleats to compressed wood panels.

This short report indicates that the TV manufacturers are looking forward to a good year. We believe that the entire woodworking industry faces a good year. One of the ways to make it good for each one of us is to be aware of the best way to do a job—whether it be a nailing machine, conveyor system or a new finishing method.

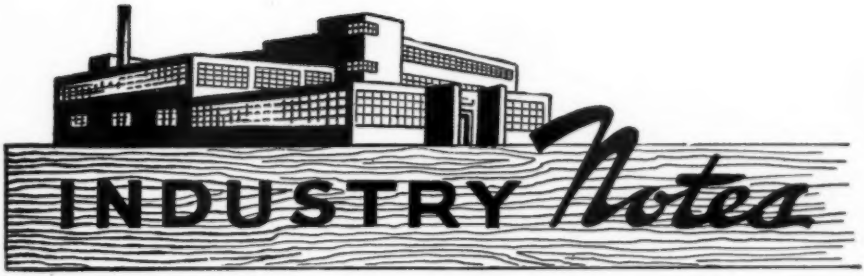
WESTERN PINE MEMBERSHIP DIRECTORY

The 1955 directory of membership of the Western Pine Association has been published and is being released to those who desire it.

Published annually, this year's directory lists 324 association members representing approximately 350 lumber mills. Statistics on mill capacities per eight-hour shift, species by percent of total production and detailed listings of products for each are included.

Directories may be obtained free of charge by writing to the Western Pine Association, Yeon Building, Portland 4, Oregon.

Seems like Europe has always been a jig-saw puzzle with a "peace" missing.



HEADS N.A.H.B.

Earl W. Smith contractor from El Cerrito, Calif., was chosen president of the National Assn. of Home Builders at the record-breaking 11th annual convention and exposition in Chicago in January. He succeeded Dick Hughes, of Pampa, Tex.

Other N.A.H.B. officers for 1955-56 are: Joseph Haverstick. Dayton, O., first vice-president; V. O. Stringfellow, Seattle, second v.p.; Carl Mitnick, Merchantville, N.J., secretary; and Franklin Burns, Denver, treasurer.

REDWOOD ELECTS OFFICERS

The California Redwood Association elected officers at the January annual meeting. They are: Russell Ells, president and vice-president, Kenneth Smith. Selwyn J. Sharp was re-elected secretary-treasurer. The meeting was held in San Francisco.

N.W.P.M.A. MEETING

The eighth semi-annual meeting of the National Wooden Pallet Manufacturers Association was held at the Jung Hotel, New Orleans, La., early in February. New officers are: W. R. Jordan, president; L. S. Settel, vice-president; T. N. DePew, vice-president; F. H. Woodward, treasurer; W. H. Sardo, Jr., secretary-manager.

Future projects decided upon include a set of grading rules for use with the Minimum Standard Specifications for warehouse pallets, and the new trade mark. A new brochure is planned which will be distributed to pallet users and prospects.

S.P.A. MACHINERY EXPOSITION

The Southern Pine Association is holding its 1955 annual meeting and show on April 4-6 at the New Orleans Municipal Auditorium.

Equipment displayed will include the latest in sawmilling and logging equipment and will be exhibited by manufacturers from all parts of the country.

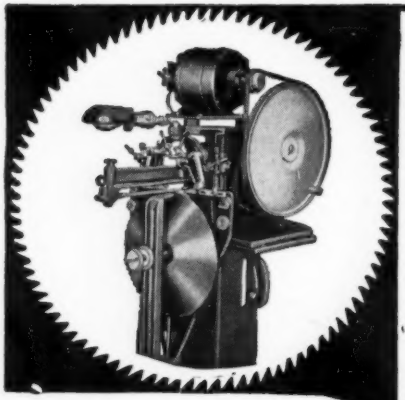
The April issue of WOOD WORKING DIGEST will carry a complete story of the show and exhibitors.

COURSES TO BE HELD

Nationally known wood seasoning experts of the U. S. Forest Products Laboratory, Madison, Wis., will conduct a two-week demonstration course in kiln drying from March 28-April 8 at the laboratory. Enrollment will be limited to 35 men and the fee is $200. Subjects to be covered include basic principles of air drying and kiln drying, types of dry kiln, kiln equipment, operation and tune-up.

A short course in quality control will be held at the State University, College of Forestry, Syracuse, N.Y., April 12-16. The five day course, limited to 15 students, will include a study of the quality problem, basis of control, control charts, acceptance sampling experimentation and problem analysis and practice of quality control.

Another course will be conducted at the same time and same place on hardwood lumber grading. The course



Your SAWS
are no better than your
SAW FILING

Inaccurate saw filing can ruin the cutting efficiency of the best saws, perhaps crack or break them. The machine precision of Foley Saw Filing can increase your sawing output 25% to 40%. The Foley *automatically* joints the saw as it is filed, making all teeth uniform in size, height, spacing. Foley-filed saws run cooler, cut fast, do beautiful work — and stay sharp longer.

The Foley is the ONLY machine that files crosscut circular saws, band saws, hand saws.

30-DAY TRIAL of the Foley Saw Filer is offered—to show you what a difference Foley-filed saws can make.

FOLEY *Automatic* SAW FILER

FOLEY MFG. COMPANY
3351 Foley Bldg.
Minneapolis 18, Minn.

Please send literature on the Foley Automatic Saw Filer and details of your 30-day Trial.

Name.....

Address.....

will include a study of the variable nature of wood, hardwood lumber defects, national hardwood inspection service and regulations, measurement and tallying of hardwood lumber, standard hardwood lumber grades and standard and special inspection.

APPOINTMENTS

Robert M. Zimmerman is now the general manager of operations for Atkins Saw Division of Borg-Warner Corp.

R. Hoe & Co., Inc., New York City, has appointed **William A. Harloe** as vice-president. He is general manager of the saw division as well.

Koppers Co., Inc., has named **E. W. Volkmann** as manager of the Research Department. He will be charged with coordinating all Koppers research. Volkmann has been with the department since 1940.

Franklin Freeman has been appointed field representative in Illinois and Wisconsin by the Western Pine Association. He will headquarter in Chicago.

U. S. Plywood has announced that **Richard S. Lowell** is now director of sales promotion and advertising. **John R. Thompson** has been made advertising manager.

Hugo Cohn has been elected president of the Radio Receptor Co., Inc., Brooklyn, N. Y. He succeeds Ludwig Arnson, who is retiring from the presidency after 31 years.

Davidson Plywood & Lumber Co., a subsidiary of the Atlas Plywood Corp., has appointed **Richard S. Bartlett, Jr.**, to serve as president of the company. He has been with the company for eight years.

Fred Atkinson, well-known woodworker and veteran glue salesman, is now selling and servicing the states of Michigan, Ohio and Indiana for the National Casein Co.

Joe M. Clarke of Clarke Veneers & Plywood, Columbia, S. C., announces that his son, **Holden M. Clarke**, is now associated with him as sales and service representative.

General manager of the Columbia Division, Lodge & Shipley, Hamilton, Ohio, is **Joseph V. Delaney.** The Columbia Division manufactures hydraulic and electronic presses for woodworking.

Clarence May has joined May Plywoods, Inc., Chicago, as vice-president in charge of production. He will headquarter at the Chicago office, 726 S. DesPlaines St.

NEW QUARTERS FOR SWIFT

Wesley K. Swift has announced the opening of modern new offices in the Fifth Ave., Bldg., 1630 Fifth Ave., Moline, Ill. This firm is the eastern representative for Cascade Plywood Corp., Hardboard Division. Recently Wesley K. Swift Associates has added eastern distribution for "Fybr-Tech" and "Mesh-Tech." This organization is also representing Schmutz Manufacturing Co., Louisville, Ky., manufacturers of coating machinery for industrial panel stock for the television, radio and furniture field.

M.F.M.A. ELECTION

D. S. DeWitt was re-elected to his fourth term as president of the Maple Flooring Manufacturers Association at the 58th annual meeting. Other officers elected at this Chicago meeting are: W. W. Gamble, Jr., vice-president; S. A. Wells, treasurer, and L. M. Clady, secretary-manager.

In his remarks at the meeting, Mr. DeWitt indicated that, the industry is gaining in its uphill struggle to hold classroom floors for maple. He said, "Our friends, the architects, have tried synthetic floor coverings for classrooms as one way to save a few dollars, but it is encouraging to find more architects these days flatly refusing to go along with some of these extreme suggestions for cutting costs."

"Do-It-Yourself"

Erect Your Own

REES BURNER

You Save Money!

Erection instructions furnished. 13 double wall and 20 single wall sizes available. Whirlwind burning action consumes all wood waste materials.

Send for Bulletin 37

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REES BLOW PIPE MFG. CO.
2929—5th ST., BERKELEY, CALIF.

REES BURNER & BLOW PIPE CO.
P.O. BOX 225, MEMPHIS, TENNESSEE

REES BURNERS LIMITED
1331 W. 6TH AVENUE
VANCOUVER, B.C., CANADA

IRVINGTON REPRESENTATIVE

Irvington Machine Works, Inc. of Portland, Oregon and Grand Rapids, Michigan, have recently appointed The P. B. Yates Machine Co., Ltd. of Hamilton, Ontario, as their agent in eastern Canada with exclusive rights on the multiple saw random length trimmers and end printing equipment. Throughout the provinces of British Columbia and Alberta, the W. A. Akhurst Machinery Co., Ltd. of Vancouver, B.C., is the exclusive representative of the entire Irvington line.

PROGRAM AT NATIONAL STARCH

Frank Greenwall, president National Starch Products Inc., announces that the company plans to enter immediately upon a long range program for the expansion and modernization of all company manufacturing and research facilities.

The plan, which provides for the expenditure of $3,500,000, has been approved by the board of directors, and will provide for the following:

1. New and modernized equipment will be installed at the Plainfield, Chicago and San Francisco plants.
2. Expansion and modernization of buildings and equipment at the Indianapolis plant, which will substantially increase the present starch grind, as well as the capacity for making unique specialty starches.
3. Alexander Research Laboratory, Plainfield, N. J., will be doubled in size, so as to consolidate and coordinate all starch, resin and adhesive technical and research efforts in the east.
4. Equipment improvements to permit more efficient manufacture of the many new resin products introduced in the last several years.

National Starch recently announced the placing of a contract with the Blaw-Knox Co. of Pittsburgh, to erect a second vinyl resin plant at Meredosia, Ill.

S.H.P.I. ANNUAL MEETING

The Southern Hardwood Producers, Inc., will hold its annual meeting on March 10-11, Roosevelt Hotel, New Orleans, La. Featured on the first day's program are R. H. Sullivan, vice-president of the Ford Motor Co. who will speak on automation. George Fuller of the National Lumber Manufacturers Association will complete the morning with an account of the important legislative matters being considered in Washington, D. C.

The morning session of the second day will deal primarily with industry problems and the association activities related thereto. Leo Bodine, executive vice-president of the N.L.M.A. will outline the over-all work of the association and the importance of these efforts to the southern hardwood industry.

W.O.F.I. ELECTIONS

Sterling Lord has been re-elected president of the Wood Office Furniture Institute at the annual meeting held recently. The association approved W.O.F.I. sponsorship of a new program of sales training clinics to be held in

HARTFORD CLAMPS
Since 1915

Single Bar Clamp

Style No. 5, with loose or fixed handle
Fast acting, general purpose clamp with Hartford rapid-action tail piece for quick adjustment to work.

HARTFORD CLAMP COMPANY • EAST HARTFORD, CONN.

44 cities during 1955 and heard reports from officers of allied associations on market conditions and results of wood research.

Other officers elected were Raphael Blessinger, vice-president; Ralph F. Schneider, treasurer; V. L. Gutzweiler and T. R. Pitts, members of the five-man executive committee.

NEW SALES AGENCY

Edward B. Mueller, 5320 Montgomery Road, Cincinnati, Ohio, announces the forming of a new sales agency to distribute new, used and rebuilt woodworking machinery. For the past 20 years Mr. Mueller has been associated with the Earle Hart Woodworking Machinery Company, traveling the states of Ohio and Kentucky as well as southern Indiana.

The new company will represent Baxter D. Whitney & Son, Mereen-Johnson Machine Company, S. A. Woods Machine Company, B. M. Root Company and the C. O. Porter Machinery Company in the same territory.

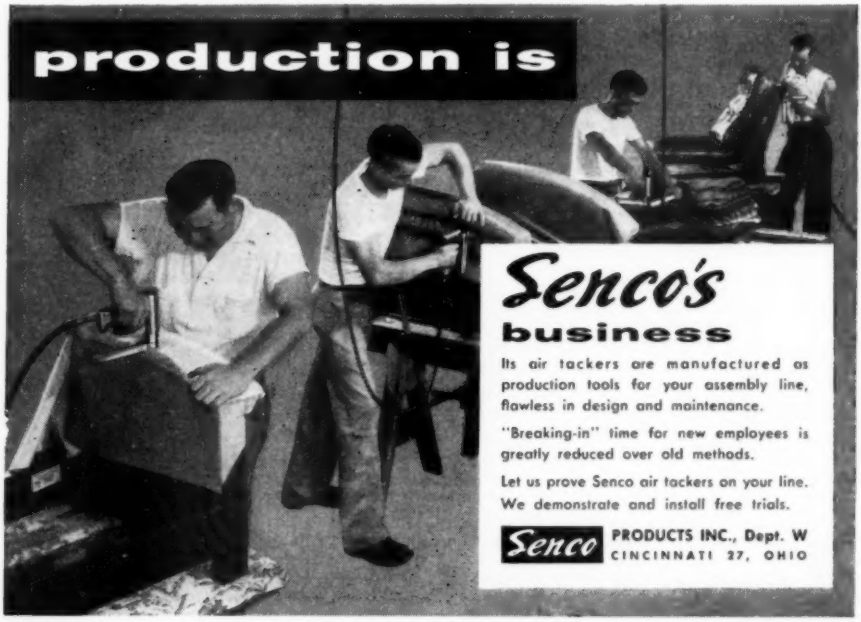
S.P.A. ADDITIONS

Two important additions to the staff of the Southern Pine Association are announced by S. P. Deas, secretary-mgr.

The new staff members are E. C. Schmitt, of New Orleans, Traffic Manager; and Thomas E. Brassell, of Tuscaloosa, Alabama, Engineer in the Trade Promotion Department. The appointments are in line with the current acceleration of all association activities.

FIRTH STERLING APPOINTS

In line with its policy of increasing market facilities for users of tool steel and tungsten carbide products, Firth Sterling Inc. announces the appointment of the following authorized distributors for Firthite tools, tips and blanks; high speed tool bits; drill rod; and ground flat stock: Cutting Tools and Supplies Inc. of Pontiac, Mich.; Complete Industrial Supply Company of Tucson, Ariz. and Utility & Industrial Supply Company of Jackson, Mich.


production is
Senco's
business
Its air tackers are manufactured as production tools for your assembly line, flawless in design and maintenance.
"Breaking-in" time for new employees is greatly reduced over old methods.
Let us prove Senco air tackers on your line. We demonstrate and install free trials.
Senco
PRODUCTS INC., Dept. W
CINCINNATI 27, OHIO

"PROVIDE FOR TOMORROW BY BUYING TODAY"...

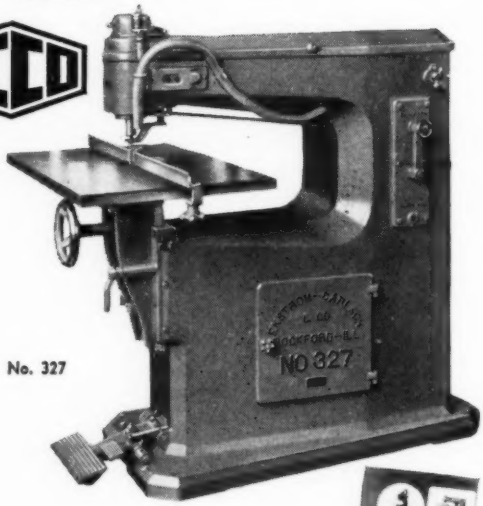
EKSTROM CARLSON

HIGH SPEED ROUTERS

No. 156

ECCO

In all types of woodworking plants and departments, from toy manufacturers to fabricators of fine furniture, from aircraft makers to novelty shops, ECCo High Speed Routers have proved to be one of their most valuable production tools. Perhaps the most important feature, in addition to the basic principles of truly *high speed* routing, is the precision and quality built into ECCo machines. This guarantees accurate and reliable operation throughout an exceptionally long and productive life.



No. 327

CONDENSED SPECIFICATIONS		
	No. 156	No. 327
Motors	1½ hp, 3 ph 1½ hp, 1 ph	3 hp, 3 ph 5 hp, 3 ph 7½ hp, 3 ph
Spindle Speeds	20,000 rpm	10,000 rpm 20,000 rpm
Work Table Size	20" x 26"	24" x 36"
Throat Clearance	15"	27½"
Height, Floor to Table	34½" min. 40" max.	34" min. 41" max.
Actuated Table Travel	2¾" min. 4" max.	4"
Collet Capacity	¼"	½"

WRITE FOR LITERATURE

Learn all about the interesting details of ECCo High Speed Routers. Write today for Bulletin R100 giving full information.

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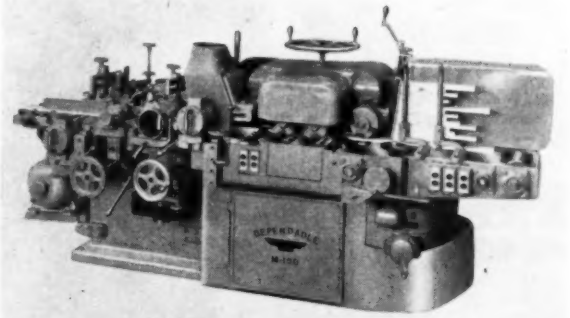
1411 RAILROAD AVE., ROCKFORD, ILLINOIS

MOULDERS • SANDERS • ROUTERS • SHAPERS • CARVERS • PANEL SIZERS • GROOVERS

EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

DEPENDABLE ADDS 10" MOLDER



Dependable Machine Company, Inc. of Greensboro, N.C., designers and manufacturers of production woodworking machinery announce the Dependable M-150 (10") electro-unit drive molder. This machine is offered in the standard 10" x 4" size and is also offered with random length hopper feed which takes stock as short as 6". The molder is designed for both high speed production, by use of round and milled-to-pattern heads, and detail work, by use of square heads. Any type of molding from the tiniest bead molding up to the capacity of the machine can be made equally well. For quick change-over on patterns the removable cartridge spindle unit feature is used.

The Dependable M-150 is of the same design and construction as the company's M-148 (8") model. The M-150 is designed with removable cartridge spindle units which may be taken out of the machine with head intact for grinding and jointing in the filing room. Spindles are driven through short, endless belts which give high spindle speed without a frequency changer. This makes it possible for fewer knives to do the same quality work. Standard motors are used to drive the spindles. The standard machine is equipped with a total 40 h.p., but even larger motors are available if wanted.

The machine is equipped with a variable feed unit which gives any feed rate from 20 to 150 f.p.m. The variable feed unit makes it possible to run the stock at the maximum feed rate for the quality of the stock wanted. The

Reduce Costs by assembling your products easier and stronger with "Rockford" Quality Controlled Threaded Fasteners.
We manufacture a complete line.
Cap and Set Screws
Socket Head Cap and Socket Set Screws
Studs
* Machine Screws and Stove Bolts
Nuts — Square & Hexagon
* Wood Screws and Drive Screws
* Sheet Metal Screws
Carriage Bolts
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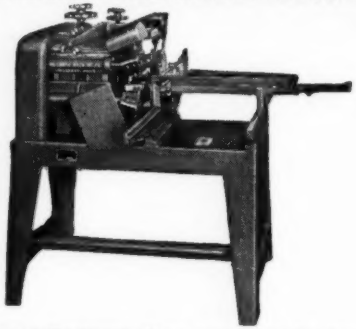
HARRIS
DELUXE FLOOR MODEL TENONER



New adjustment allows exact and simultaneous adjustment of tenon spindles.
3 H.P. Motor
3 Inch Blades
V Belt pulley drive on both tenon and cope spindles.
Heavier Construction for greater accuracy.

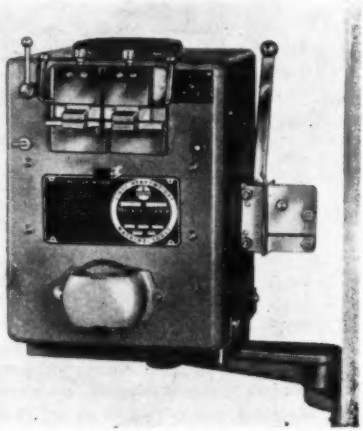
MILLBURY MACHINE COMPANY
13 WATERS STREET, MILLBURY, MASS.

hold-down unit is of a new type construction that makes it possible to remove the hold-down bar without tools of any kind. Spindle units are interchangeable and the speed of the spindles can be varied independently.

The M-150 molder will take heads as small as 5½" cutting circle and has a maximum swing of 10" on the top and bottom head and 9" on the side heads. The standard cutting circle is 6½".

BAND SAW BLADE WELDER

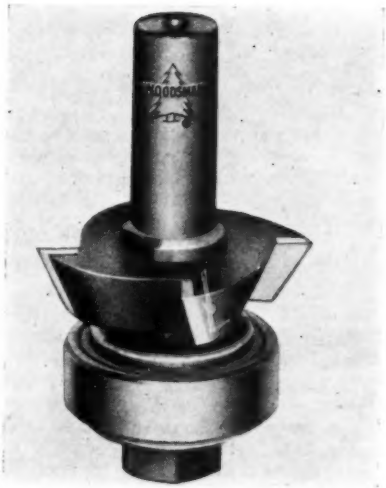
The average time it takes to butt-weld a band saw blade is less than two minutes with this new ¾" capacity light-heavyweight band saw welder offered by the Walker-Turner Division of Kearney & Trecker Corp. of Plainfield, N.J.



Its features include quick, easy operating, adjustable heavy duty blade clamps with cam locks and a built-in flash grinder. The 115-volt model includes a cut-off shear, a 230-volt model is also available.

BEVEL TRIM TOOL

Available from stock in 14, 29, 44 and 59 degree angle bevels, the new Woodsman tool eliminates hand finishing of plastic tops. The unusual compound



radial and helical angles of the finely balanced, four-blade tool gives a down-shear cut to the plastic top sheet removing the entire overhanging edge to a smooth, even, beveled edge in one pass of the tool.

For further details, write North American Products Corp., Dept. WD, Box 210, Center Grove Rd., Edwardsville, Ill.

BRASS BALL FERRULES

A unique and revolutionary process of manufacturing quality, seamless, all brass, ball ferrules for furniture legs was recently developed and announced by Tubing Seal Cap, Inc., Dept. WD, 808 West Santa, San Gabriel, California.

To introduce the line, Tubing Seal Cap, Inc. is offering representative samples plus price and quantity structures in answer to inquiries from manufacturers and designers of furniture and related products.

CORLEY ALL STEEL ELECTRIC TRIMMER

The Corley all steel electric trimmer has no long saw mandrel to invite vibration. Instead, each saw has its own short arbor separately powered

For HIGH SPEED PRODUCTION BORING

Choose the Electro-Mechano

Maintains accuracy and quality while increasing your output in all types of dowel boring screw holes, etc.

For smallest drill sizes up to ¼" bores in any type of wood. Instant *variable* speed control from 1,000 to 10,000 rpm or 2,500 to 15,000 rpm using direct drive electric motor spindle. Sensitive, easy to operate hand feed or automatic self feed. Adaptable to simple or complex boring and drilling operations.

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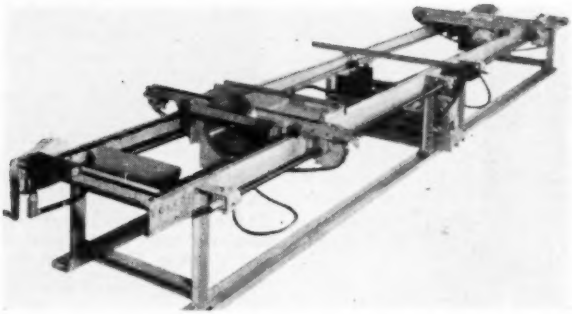
The ELECTRO-MECHANO CO.
264 East Erie St. Milwaukee 2, Wis.



through a V-Belt by its individual 5 h.p. motor, and the entire unit is attached to a movable transfer block. Saws can be slightly angled for lead, so that there is not pinching at the tail of the saws. Saw changing is a fast operation, and can be handled without affecting the adjustment of saws or transfer blocks. Saws up to 24" diameter may be used successfully. Lumber up to 8" in thickness can be cleared through 24" saws. Ordinarily, 5 h.p. 3 phase motors, 220-440 V, are furnished. On special order, single phase motors may be substituted.

The transfer block chains (Pintle Type) are driven by a set shaft, connected by roller chain through a reduction gear with a two-speed 1½ h.p. electric motor. Two rates of feed are at the instant command of the operator. The slow feed takes boards through the saws at an approximate rate of one board each four seconds. The fast feed has an approximate rate of one board each two seconds.

Sensational NEW Dovetail BIT!

• TOUGHER
Cuts hardest materials easily

• CLEANER CUTS
Cuts smoother and more evenly

• LONGER LIFE
15 to 20 times longer productive life

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ALEXANDER DODDS COMPANY
451-453 Monroe Ave., N.W.
GRAND RAPIDS ☆ MICHIGAN

NEW TITAN High Speed Hanger Bolt Driver

• TIMED IN SECONDS!
This tool is used by a majority of plants where hanger bolt driving is done on a high production basis. Can be operated at any speed which is safe for driving the hanger bolt. It is not necessary to stop rotation at any time.

NEW COLLAPSIBLE TYPE TRIP GAGE
Patented. Has such a large adjustment range, made possible by a new all-thread main ring, that most common stud projection heights can be secured with only one gage.

• AUTOMATIC TAKE-UP FOR WEAR ON JAWS
• REVERSING POSITION OF CLUTCH GIVES DOUBLE WEAR AT HALF COST
• AFFORDS ACCURATE PROJECTION HEIGHTS
• USE WITH ANY AIR OR ELECTRIC DRILL OR DRILL PRESS

Write for Free Literature, Today!

TITAN TOOLS
TITAN TOOL CO.
Production Tools
49 Main St.,
FAIRVIEW (Erie County), PA.

The trimmer may be furnished with either a manual saw shift, or an automatic electric saw shift. All the controls on either type trimmer are located at one end of the trimmer, easily accessible to the operator. For more complete information write to the Corley Manufacturing Company, Chattanooga 1, Tenn.

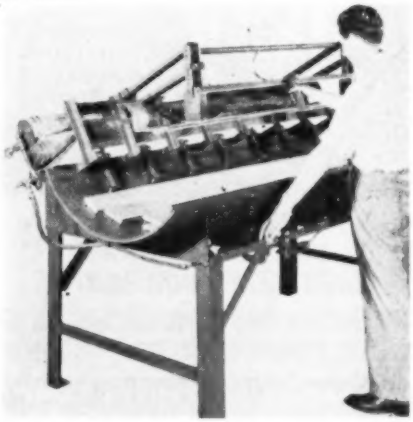
GLUE GUNS

The John P. Fox Co., 5514 York Blvd., Los Angeles 42, Calif., is offering a leaflet on "FF Glue Guns." These guns are operated with compressed air and have numerous applications in wood products manufacture. Here are some of the applications where glue can be spread with these guns: dovetails, mortise grooves, cleats, where glue must be spread at a 90° angle and dowels.

Assemblies consist of the following items: 1 tank; 10′ air hose; 10′ fluid hose for each outlet; 1 air regulator; 1 air pressure gauge; 1 air valve and fittings to assemble all items. Guns are available in 10 styles.

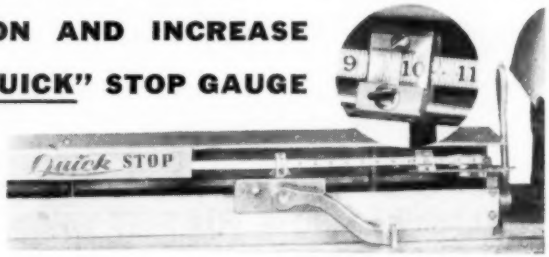
SAVES BONDING TIME

The edge-bonding of casket tops, formerly a time consuming operation, can now be done in a matter of seconds. A new dielectric press, a product of Radio Frequency Company of Medfield, Mass., makes a revolutionary speed-up possible.



Cabinet Shops . . . Furniture Builders . . . Production Shops

BOOST PRODUCTION AND INCREASE ACCURACY with "QUICK" STOP GAUGE



Absolute Accuracy . . . Adjusts in 5 Seconds!

Check These Features . . .

1. **ACCURATE—Rigid construction and accurate tape give precise and absolute cuts.**
2. **FAST—Moves easily and locks rigid to new position. Changes are made in 5 seconds.**
3. **VERSATILE—Cuts to 112 inches, with either cut off or swing saws.**
4. **CONVENIENT—All controls are within instant reach during operation, and length of cut is always visible on dial.**

CONSOLIDATED MACHINERY & SUPPLY CO., LTD.
2033 SANTA FE AVE., LOS ANGELES 21, CALIF.

The "QUICK" STOP GAUGE can reduce cutting operations by 75% and leaves bench clear. When not in use it can be flipped up to clear area. Professional users say: "Fast and accurate . . .", "paid for itself already".

The "QUICK" STOP GAUGE is a must for your shop. Write today for complete information and name of dealer.

NEW! IMPROVED STIX

FOR CEMENTING

- CONSOWELD
- FORMICA
- RESILYTE
- FORMICA
- TEXTOLITE
- PANELYTE
- LAMINEER
- V-BOARD
- PANAPLEX
- PLASTILITE
- FARLITE

...THE ONLY CEMENT WITH THE LONGTIME SHELF LIFE GUARANTEE

NEW STIX Does Not Thicken With Age. STIX Needs No Clamps, Presses or Heat.

ADHESIVE PRODUCTS CORP.
1660 BOONE AVE. NEW YORK 60, N. Y.

INTRODUCTORY OFFER AT NEW LOW PRICES!

NEW! MARCOLOY CARBIDE ROUTER BITS

1. Cutting edges diamond-ground
2. Free and cool cutting
3. Designed for long life
4. Notched for end and plunge cutting

½ SIZE .....$5.75 each

Send for catalog

MARCOLOY CARBIDES

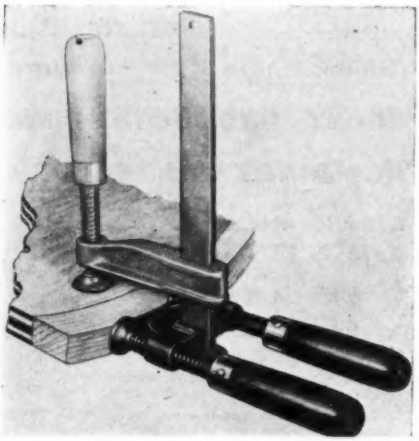
MARCOLOY, INC. Springdale, Conn.
Dealer Inquiries Invited

The press, designed and constructed for a large casket manufacturer is powered by an economical 5 kw. dielectric heater. Beaming electronic waves through the glue accomplishes a cure in 35 seconds.

Radio Frequency Company, pioneers in the manufacture of ultra-fast high frequency and dielectric generators, is also equipped to custom build presses for special application. Dielectric heaters range from 1 kw. to 20 kw.; with selection depending on job requirements.

CROSS-CLAMP FOR SIDE PRESSURE

Wetzler cross-clamps can be used in conjunction with the Wetzler quick action clamps to obtain side pressure. The double spindle type (illustrated) exerts pressure in two places on either side of the quick action clamp. In this way fewer of the quick action clamps are needed because they can be spaced at larger intervals.

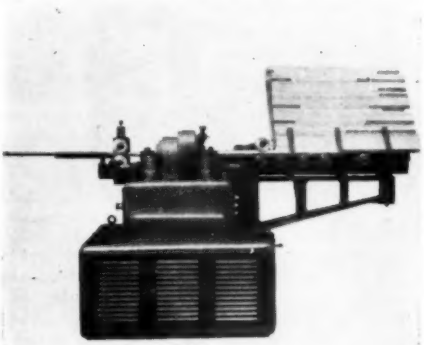


The cross-clamps are available in single or double spindle models. The spindles are ⅝" diameter. These clamps are especially recommended for curved work.

Beating a railway locomotive to a crossing is dead easy.

FEED ATTACHMENT FOR DOWEL MACHINE

Dowel makers can use a semi-automatic feed attachment developed by Hawker Manufacturing Co., Dayton, Ohio. The attachment enables one man to keep the Hawker dowel machine supplied with stock. The stock, which can be of random length and need not be picked for exact squareness or freedom from bark, is merely bulk loaded periodically on the feeder as needed.

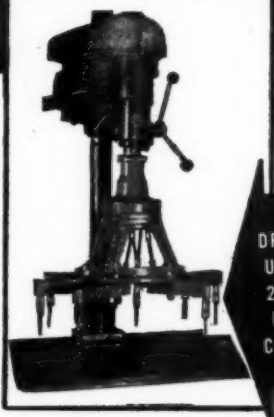


The semi-automatic feed consists of a rack which permits one piece of stock at a time to drop onto powered rolls which move it at proper speed into the dowel machine self-centering stock guide.

WALKER-TURNER RADIAL SAW

A completely re-designed light-heavyweight radial saw is announced by Walker-Turner Division of Kearney & Trecker Corporation of Plainfield, N. J. It features a new 1½ h.p., 3450 r.p.m. single-phase motor which, the manufacturer claims, will accommodate relatively large-sized work while operating on low-cost 115-230 volt, 60-cycle current.

With table dimensions of 28¾"x50", and a ram travel of 26⅝", the machine will rip to the center of a 60" panel. Its cross-cutting capacity in 1" stock is 24" from the second fence. The uni-



FASTER HOLE PRODUCTION

WITH

Commander MULTI-DRILLS

● Drills up to 8 Holes at 1 Stroke ● Fits Any Drill Press
● Adjustable to Any Hole Pattern
● Quickly Pays for Itself Many Times Over

● Commander MULTI-DRILLS are instantly and easily adjusted to handle any hole pattern within a 9" circle. Standard Extension Spindles will increase working area to 22½". Minimum center distances close as ½". Compact in design, ruggedly built, Commander MULTI-DRILLS are making BIG Savings in time and labor for woodworking plants everywhere. Special adaptations available.

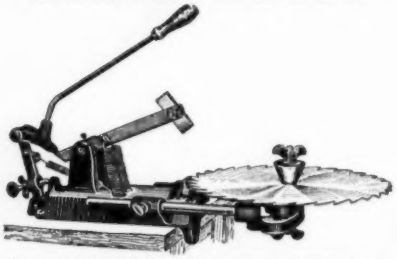
Write FOR CATALOG #851 which describes Commander's Production Tools

Your nearby Commander Distributor has the MULTI-DRILL. Write for his name.

Commander MFG. CO.

4222 W. KINZIE STREET • CHICAGO 24, ILLINOIS

SIMPLEX
CIRCULAR SAW SETTING MACHINE



An excellent tool for setting small circular saws. The successful operation of all circular saws depends largely upon the manner in which they are fitted.

To obtain the best results the teeth should be properly and evenly set.

This machine does the work perfectly, insuring easy and true running and smooth cutting.

The hammer strikes every blow with equal force and at the same angle hence the set of each tooth is absolutely uniform. Will give a light, medium or heavy set.

Adjustable for saws, either rip or cut-off, from 5" to 24" in diameter.

The machine will last for years if handled with ordinary care and intelligence.

Further details upon request

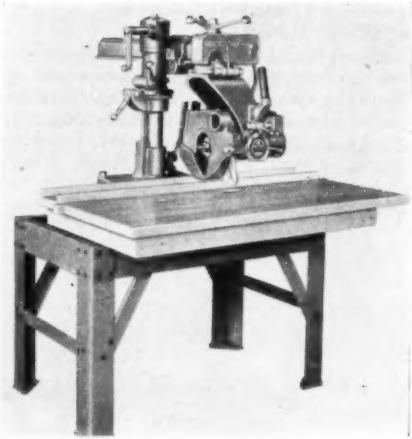
ZEILLER & NAGEL, INC.
232 JAVA ST. BROOKLYN, 22, N.Y.

It's The Performance You Get From Wysong Dovetail Bits That's Most IMPORTANT!

A long life of accurate, clean cuts is what you get with *Wysong Dovetail Bits!* Precision made from carbon or high-speed steel, and individually hand finished. They are economical to buy and continue to save you money by standing up under continuous hard use.

WYSONG

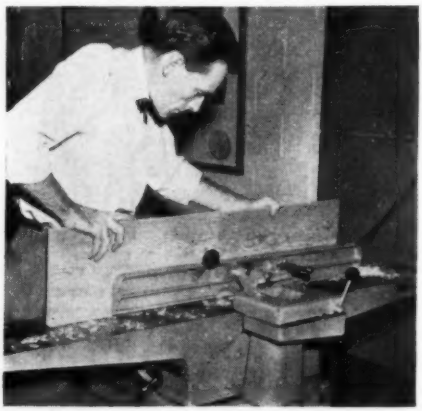
DOVETAILERS • MORTISERS • SANDERS
WYSONG and MILES COMPANY
Dept. DB, Greensboro, N. C.



versal head is designed with new quick-acting locating latches, self-compensating for wear, which are said to help maintain initial setting accuracies for the life of the machine. A 2 hp 3-phase motor for 220-440 volt current is also available. Standard equipment includes a 10" dia. 8-tooth carbide tipped saw blade.

DELTA 8-IN. JOINTER

An improved version of the Delta 8" jointer introduced by the Delta Power Tool Division of Rockwell Manufacturing Company, 440 N. Lexington Ave., Pittsburgh 8, Pa., will re-



duce changeover downtime, increase versatility and lower operational costs of the machine in woodworking shops.

An outstanding feature of the redesigned machine is an improved fence with a plunger-type positive stop at zero and 45 degrees right and left. Another feature is an improved table-elevating mechanism featuring 6" cast iron hand wheels for easier, quicker manipulation.

For longer life without maintenance, the machine's fully adjustable infeed and outfeed tables have been redesigned to ride in dovetailed ways equipped with a take-up gib to compensate for wear.

"JORGENSEN" HINGED CLAMPS

A new principle in the use of "clamps" is now made possible by the announcement of the No. 2203 steel track which is available for all styles of "Jorgensen" hinged clamps. This type of clamp, which has been on the market only for a few months, is "hinged" so that it swings on its mount up to clamping position or swings out-of-the-way when not in use.

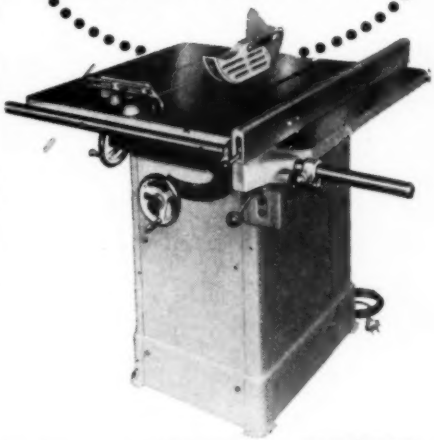
Now, when mounted in the No. 2203 steel track, the clamp not only swings in an arc of nearly 180° up to or away from the work, but is adjustable "sideways" along any length of track installed; therefore, in jigs and fixtures for production operations, or on a sawhorse or bench, the clamp-user can have his clamps always at hand, easily brought up to the work to be clamped. There is no lost time looking for clamps, and the clamping operation is extremely rapid owing to the "instant-adjustment" of the clamp within its capacity range.

The No. 2203 steel track is furnished in 24" sections, rust proof finish, complete with mounting screws; it can be cut to shorter lengths—or butted together for longer lengths. Complete details available from Adjustable Clamp Company, 418 N. Ashland Ave., Chicago 22, Ill.

new

heavy duty

10" TILTING ARBOR SAW



SAFE . . . ACCURATE . . . POWERFUL

Big, rugged, safe, powerful, precision machined for utmost accuracy. Check these features: Operates from 1 or 1½ H.P. motor . . . has 3 belt drive utilizing full motor power . . . extra heavy trunions for rigidity . . . large ground and polished table top . . . improved front and rear locking rip fence . . . tubular guide bars increase table capacity to 44½ " . . . graduated scale on front bar . . . blade tilting and raising wheels lock securely . . . specially designed mitre slot "holds" gauge and prevents accidental dropping . . . snap-out base panel for sawdust removal, plus others.

SPECIFICATIONS: *Table top 33"x38" with ext.; depth of cut 3¼"; at 45°—2-7/16"; ⅝" spindle mounted on sealed ball bearings; standard equipment includes: deluxe mitre gauge, throat insert, rip fence, comb. blade, guard, splitter, anti-kick back, switch bracket, motor pulley and V-belts only* $295.

Send for FREE Catalog

giving complete details on saw and other power tools in the vast Duro line.

DURO METAL PRODUCTS CO.

2670 N. Kildare Ave. Chicago 39, Ill.

World's largest manufacturers of Power & Hand Tools (Duro Chrome)

TWO SANDERS IN ONE

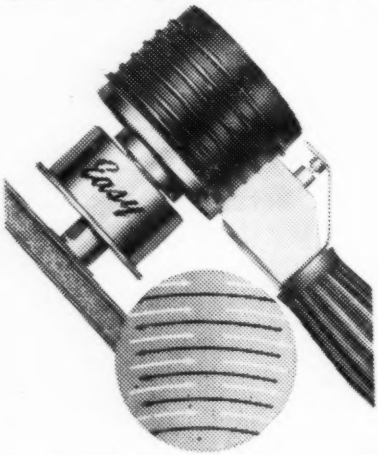
An entirely new type of sanding machine is announced by the Detroit Surfacing Machine Company, manufacturers of a line of pneumatic and electric Detroit "Easy Finishers." Following is the company's description of this unique new Model D.A. Dual Action Sander.

A completely new type of air powered sander that is really two units in one. Each unit operating with a dual action.

Dual-action moves in two directions at the same time. Turning 6000 R.P.M.'s to the right, and at the same time moving in a fast reverse action to the left.

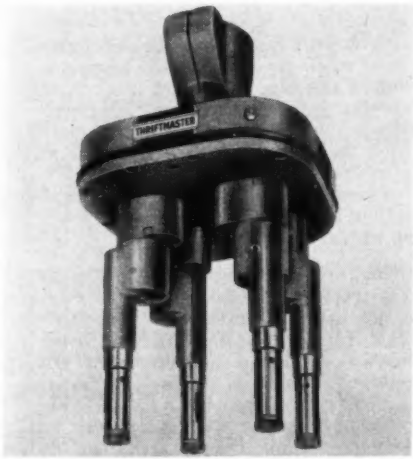
Outstanding results of this new sanding action are much faster cutting and important savings in abrasives. Even when sanding lacquer, surfacer, solder (hot or cold) plastics and other materials that quickly load, the abrasive life with the D.A. is up to 90% longer, it is claimed.

The Model D.A. is air-powered. Weight is 3 lbs. For literature write the Detroit Surfacing Machine Company, 1333 E. Eight Mile Road, Detroit 20, Michigan.



DOUBLE ECCENTRIC ADJUSTABLE DRILLHEAD

A new full ball bearing double eccentric adjustable drillhead is announced by Thriftmaster Products Corp., 1038A N. Plum St., Lancaster, Pa. The spindles of this head have a very large range of adjustment and may be set to drill irregular hole patterns.



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GAMBLE BROTHERS GB GUARANTEED BOND INCORPORATED

Engineered Wood Parts in Southern and Appalachian Hardwoods, Walnut, or Mahogany.

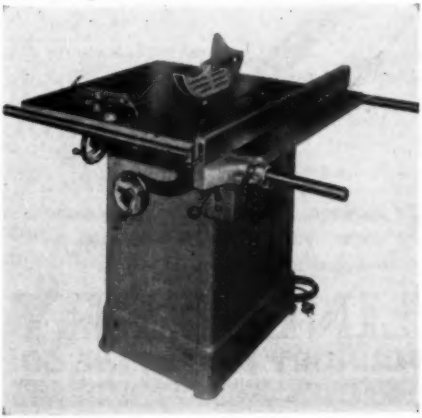
OFFICES AND PLANT: Louisville 9, Kentucky

All spindles are provided with vertical or depth adjustment and are held rigid by means of a unique clamping device which prevents damage to the head by excessive tightening. Wide faced stub tooth gears provide maximum strength and quieter operation. Twenty standard models are available with 3, 4, 6, or 8 spindles, having drilling capacities up to 1 1/16" diameter holes in steel.

TILTING ARBOR SAW

The Duro Manufacturing Company of Chicago has announced a new addition to their expanding line of heavy duty power tools. This completely new 10" tilting arbor saw has the latest improvements and features plus many exclusive advantages.

Operated from any standard 1 or 1½ h.p. motor, the saw is driven by a three groove arbor pulley with three matched V belts to utilize entire motor power output. Motor mounts directly beneath table surface—yet away from the sawdust stream. Heavy duty trunions are extra rigid, extra strong, to provide continuous vibration-free operation. Entire motor mechanism can be concealed by a steel shield (available as an extra) which mounts directly to base and can be easily removed for making belt or



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Nutting
Most Complete Line of Floor Trucks in America

Figure 321—Lumber Buggy. Large wide tread wheels for outdoor as well as indoor use.

Figure A—Balance style for turning sharp corners. Variety of superstructures and wheel sizes.

Figure 1191—Timber Dolly. Used as a dolly or, inverted as a portable roller.

Figure 2419 and 421—Jacks and Skids. Stores and transports materials with one-time handling. One Jack services many Skids.

WRITE FOR FREE LITERATURE

SINCE 1891 **NUTTING TRUCK & CASTER CO.**
1129 Division St. • Faribault, Minnesota

mechanical adjustments.

Blade tilting and raising wheels can be locked at desired settings. Specially designed mitre gauge slot "holds" mitre gauge securely and prevents accidental dropping at start of cut yet can be easily removed when cut is completed. Base is equipped with snap-out panel for removing sawdust. Table top measures 33" x 38" with extensions; depth of cut 3¼"; depth of cut at 45°—2-7/16"; dado head capacity, 6"; fence bar, 50"; ⅝" saw spindle is mounted on sealed ball bearings; overall size: height 44½", depth 43½", width 50".

For more complete details and specifications write to Duro Metal Products Co., 2651 N. Kildare Ave., Chicago 39, Ill.

CUTTING VENEER WITH CARBIDES

The ability of cemented carbide to resist wear and stay sharp for long periods of time has made it possible to simplify a woodworking operation at American Seating Co., Grand Rapids, Mich., and also to increase production 30%.

The operation at American Seating involves sizing birch veneer, which the company uses on opera, school and theatre seat backs. Shipped to the company in bundles of 24 and 50 sheets, the

Lemmon & Snoap carbide tipped 18" circular saw cuts a veneer bundle at American Seating Co.

veneer must be broken and cut to size accurately on a circular saw—an important factor in subsequent pressing operations. Before carbide-tipped saws were used, the operation was tedious for the operator, hard on the saw and the cut veneer was slow in reaching the pressing area.

To get the veneer flowing to the pressing area faster, production engineers estimated it was necessary to reduce the veneer cutting job into a 3-step job. That was to split a bundle in half, then finishing the job with two cuts of the saw.

To put the procedure in successful operation, an 18" circular saw was used. However, the saw had to be resharpened every day and in a short time the diameter was worn down. This meant that the operator had to make an extra cut since the saw no longer had the "reach" to meet the 2-cut procedure.

Then the American Seating production men decided to try a carbide saw. They selected a Lemmon & Snoap circular saw. Resharpening was reduced to once a month. Today either 12 sheets of ⅛" or 24 sheets of 1/16" veneer can be cut at a single pass.

American Seating estimates the new saw will last approximately one year on the job before it will require retipping with Carboloy grade 883 carbide. This grade carbide, a tough, high wear resistance metal is supplied by Carboloy Department of General Electric Company, Detroit, in the form of standard blanks which are easily brazed to the saw body.

AUTOMAKERS USE MAHOGANY PATTERNS

Those sleek styled new cars for '55 which automakers are introducing to the public in all probability started with a piece of genuine mahogany which formed the pattern or model out of which dies were made.

Within the last few years there has been a decided increase in the use of genuine mahogany by the billion dollar pattern making industry.

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SUPREME BAND SAWS
SUPREME BAND SAWS cut faster . . . have increased cutting capacity with minimum breakage! Present day high speed equipment demands Supreme Saws. Free from kinks and imperfections. Made from the finest Special Nickel Alloy Steels, tempered for toughness . . to stay sharp! There is a Supreme Band Saw for every industry . . . for every material. Special purpose saws are made to order.
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1 to 8 qt. woodworkers glue pots.
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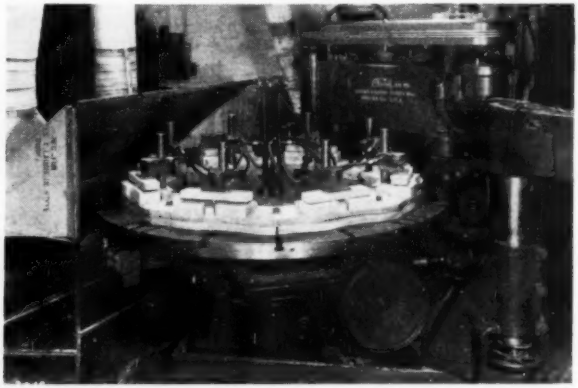
CHURCHILL CABINET
Increases Production Output

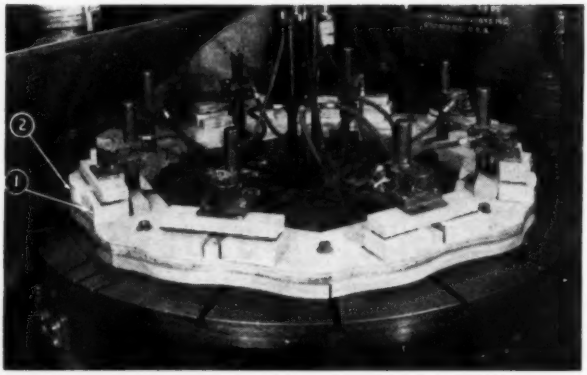
Utilizing an Onsrud WB-85 automatic shaper, Churchill Cabinet Company, Chicago, Illinois, turns out wood clock cases at a record rate. Undoubtedly the speed at which the clock cases are turned out can be credited to the shop foreman, Howard Wishnew. Mr. Wishnew has been with the Churchill Cabinet Co., 11 years. He was instrumental in designing and building the pattern which is responsible for the high production rate of the hard maple clock cases.

The Onsrud shaper cuts 8 complete blanks per minute, which consists of cutting a concave and a convex surface (Noted as No. 1 and No. 2) on each side. This is performed in 8 stations, each holding 2 pieces.

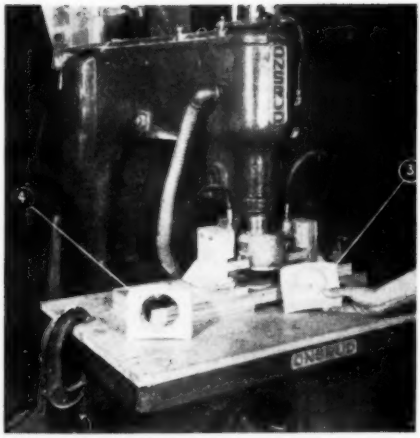
Then the maple clock cases are taken from the shaper and stacked on an inclined slide. Here they travel to two Onsrud W-244 routers. These two routers are set up to bore a 3½" diameter hole into the face of the clock case, and a hole of slightly less diameter in



Onsrud shaper showing the eight stations each holding two pieces. This cutting operation cuts both a concave and a convex surface in the blanks.



Shaper and the small but efficient dust collecting system.



Routing operation bores holes in front and back of clock case.

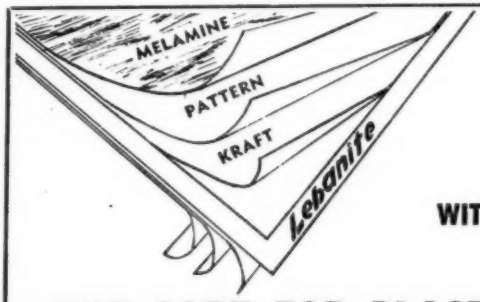
the back of the case (No. 3 and No. 4). The two different size holes leave a ledge in the case on which the operating mechanism of the clock rests. Production rate on the two Onsrud routers for these boring operations are 20 per minute.

A small but efficient dust collecting system coming in directly behind the router guard assures accurate cuts, with no chance for the router fixture to get clogged.

This combination of high speed machinery and shop "know-how" produce a smooth flow of quality wood products from Churchill Cabinet Company.

SHERM-A-PAK FOR PACKING

A new single-sheet cushioning material has been developed by Sherman Paper Products Corporation of Newton Upper Falls, Mass. The new sheet, called "Sherm-A-Pak", is formed by combining tremendous pressure and temperature to forge the fibres of the sheet into a tough permanent, cushioning crimp. The tremendous force which puts the cushioning into the fibre keeps the fibres "live." As a result, less Sherm-A-Pak is required for the same amount of protection, and savings in material are effected.



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or multiples

standard panels up to 50"x100"

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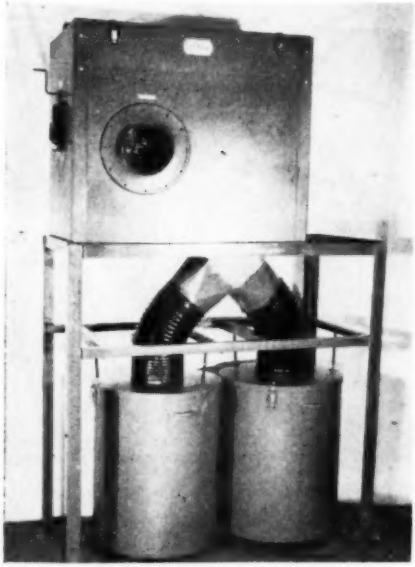
DUST COLLECTING UNIT

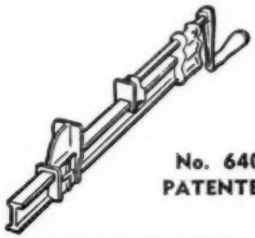
A more efficient and easily maintained dust collecting unit has resulted from several recent design changes made in Aget Manufacturing Company's "Dustkop" Model 11w50. The over-all height of the unit has been reduced by approximately 10" by elimination of the standard dust bin, and allows filtered dust, shavings, chips, or lint to drop directly into selected collecting roller cans.



The two roller cans plus the diversion "Y" have also been redesigned to permit greater capacity and ease of maintenance with a cleaner, more airtight system. The all metal, flexible diversion "Y" provides the cans with a better, more permanent seal, permitting dust to flow more freely and to settle faster. Connecting, disconnecting, and removal of dust roller cans is made easier because of a new lid closing principle. The unit is made by Aget Manufacturing Co., Adrian, Mich.

If you're smart you'll wash your hands of people who are always soft-soaping.

NO MORE RUINED JOINTS FROM SLIPPING



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BAR—Shaped to stand the greatest strain for the weight. Wide smooth flange will not mar the work.

NOTCHES—Formed in web, leaving the bar full strength as no metal is removed. Spaced ½ in. apart.

SLIDE—Malleable. Cannot slip or bind. Easily released. Heavy-tempered steel dog engages the notches making a positive stop and insuring years of service. Clamping surface, 2 x 1⅞ in.

TIP—Malleable. Hardened steel thrust bearing for end of screw, practically eliminating wear.

SCREW—Steel. ⅝ inch diameter especially treated with deep-cut "ACME" thread and long bearing, insuring long life. Crank handle steel with improved wood grip.

WRITE FOR CATALOG of the Complete Line of Hargrave Clamps, Chisels, Punches, Star Drills, Brace Wrenches, Washer Cutters, and File Cleaners.

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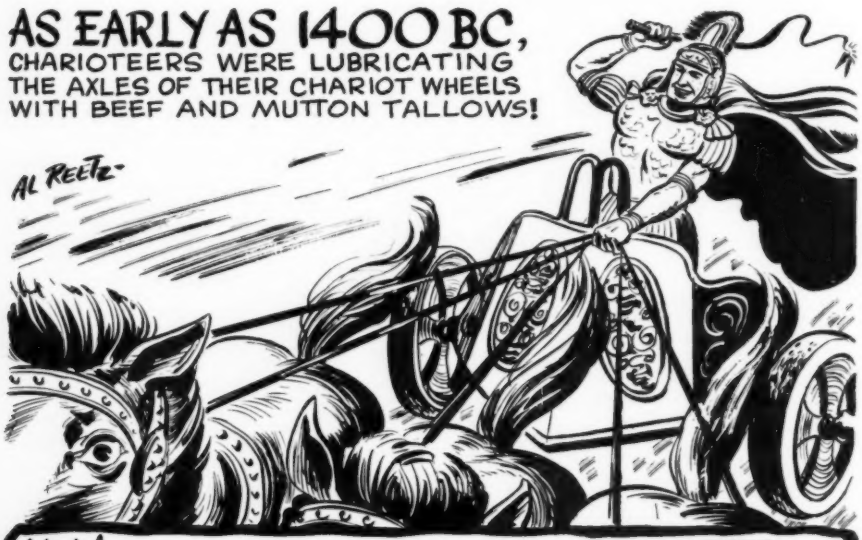
HARGRAVE
The Complete Line of Tested
TOOLS

Mechanics Through The Ages

AS EARLY AS 1400 BC, CHARIOTEERS WERE LUBRICATING THE AXLES OF THEIR CHARIOT WHEELS WITH BEEF AND MUTTON TALLOWS!



Until FREDERICK TAYLOR, IN THE 1890'S DISCOVERED THAT A STREAM OF WATER PLAYING ON THE NOSES OF CUTTING TOOLS ACTUALLY SPEEDED UP CUTTING, MANUFACTURERS OF AIR-HARDENED STEEL, IT APPEARS, FROWNED ON THE PRACTICE AND WARNED TOOL BUYERS AGAINST IT!

IT WAS WHILE DINING AT ALEXANDER HAMILTON'S TABLE IN AMERICA EARLY IN THE 1800'S, THAT MARC BRUNEL, BRILLIANT EX-OFFICER OF THE FRENCH NAVY GOT HIS INSPIRATION FOR THE 44 SPECIAL MACHINE TOOLS WHICH ENABLED THE BRITISH NAVY TO TURN OUT PULLEY BLOCKS MECHANICALLY FOR THE FIRST TIME ON A MASS PRODUCTION BASIS.

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TO CUT BOTH HEAVY MILL JOBS AND FINE SHOP WORK WITH UNERRING PRECISION

Capacity for cutting stock up to 5⅝" thick and accuracy for fine work are both available in this one machine—the Moak No. 16-A All Purpose Saw Table. Functionally designed throughout for efficient operation, Moak Tables raise, lower, or tilt at a turn of a hand wheel. Accurately graduated cut-off gauges adjust in V-slots machined in the polished semi-steel table; rip fence has rack and pinion adjustment. Choose from two models, three drives.

Get the facts **on Moak Saw Tables right away. Write for our colorful booklet.**

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Alexander Dodds Co., page 172, Literature.
Marcoley, Inc., page 174, Catalog.
Commander Mfg. Co., page 175, Catalog 851.

BORING TOOLS & MACHINES
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Electro-Mechano Co., page 171, Literature.

CLAMPS
Adjustable Clamp Co., page 63, Catalog.
James L. Taylor, page 88, Catalog.
Cincinnati Tool Co., page 185, Catalog.

CUTTER BLANKS & KNIFE INSERTS
Metal Carbide Corp., page 154, Catalog.

CUTTERS & KNIVES
Carboloy Company, page 8, Bulletin.
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DOWEL MACHINES
Hawker Mfg. Co., page 3, Manual.

DRY KILNS
Standard Dry Kiln Co., page 74, Catalog.

DUST CONTROL SYSTEMS
Kirk & Blum Mfg. Co., page 61, Literature.
Aget Manufacturing Co., page 83, Literature.
Dixie Mfg. Co., page 93, Booklet.

ELECTRON TUBES
Machlett Laboratories, Inc., page 128, Literature.

FASTENER DRIVING EQUIPMENT
Fastener Corporation, page 37, Catalog.

FINISHING MATERIALS & SUPPLIES
Beverly Manufacturing Co., page 119, Literature.

GRINDERS
Wm. Field Company, page 92, Circular.
Mummert-Dixon Company, page 179, Literature.

GLUING EQUIPMENT
Black Brothers Company, page 7, Bulletin 11-A.

HARDBOARD & EQUIPMENT
U.S. Plywood Corp. page 19, Booklet.
Radio Receptor Co., page 158-159, Bulletin No WD44.

HANGER BOLT DRIVER
Titan Tool Company, page 172, Literature.

JOINTERS
Mereen-Johnson page 46-47, Bulletin.

LUMBER & PLYWOOD
Weyerhaeuser Sales Co., page 15, Booklet.

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The Market Place

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Lists of Used and Rebuilt Machinery, either For Sale, Wanted. cr For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and a five line advertisement. For additional lines, only 75c per line.

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Mortiser, Greenlee No. 228 vertical bd. & motor
Mortiser, New Britain No. 7 bd. & motor
Mortiser W&M No. 288—5 spindle Horiz. dmd.
Moulders, Mattison No. 222, 6" bb-dmd
Moulders, Yates-American C-89—6" bb-dmd
Planer, Facing, Yates-American 36" with Jackson & Church feeder on base, bb-dmd
Planer, Whitney 36" single round head bb-dmd
Planers, F&E—30" double pb. bd. & motors
Planers, Berlin 36" round head dmd
Planers, New Crescent 24" bb-dmd
Planer, F&E No. 156 36x7 dmd. round head
Planer-Matcher, Yates A1-15"x6" round heads pb. bd.
Redrier, Merritt 12 plate 36x72
Routers, Defiance single spindle high speed dmd
Sanders, Niagara brush. bb-dmd
Sander, 48" double disc, dmd
Sander, Smith 49" 3-drum endless bed, bd
Sanders, F&E 60" 3-drum roll feed, dmd
Sanders, McKnight single drum 24"x16" dmd
Sander, Oakley Model, G2 bb-dmd. bd. block
Sander, Porter Cable vertical oscillating dmd sgl. spdl.
Sander, W&M No. 171 belt bb., md.
Saws, F&E No. 500 variety bb-dmd
Saws, Hermance Gang Rip, pb. & motor
Saws, New Delta-Crescent 12" tilting arbor, dmd
Saws, New Multiplex 40A & 50A
Shaper, Defiance double spindle, bb-dmd
Shaper, Whitney No. 389, double bb-dmd
Shapers, New Moak single spindle bb-dmd
Shapers, Greenlee No. 180 double bb-dmd
Shaper, Whitney double spindle, bb., md.
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Tenoners, Yates-Amer. No. 55 sgl. end, bb-dmd
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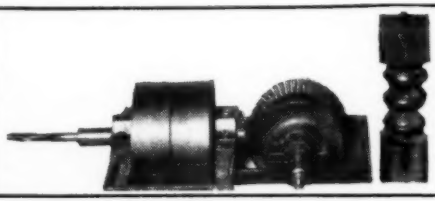

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Mortiser & Borer, American horiz. 5 hp, HC MD, $300
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No. 2½ American Ball Bearing, Double Spindle

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Greenlee 36" No. 110 Direct Motor Driven
Whitney 30" No. 32 Direct Motor Driven Ball Bearing Planer

DOUBLE PLANERS
Buss 36" Double Planer
Whitney 30" and 36" No. 24 direct motor driven ball bearing, with grinder and jointer

SANDERS
Wysong & Miles No. 171, MD., BB., Belt Sander
No. 277 Semi-auto. Belt Sander
Curtis Semi-auto. Belt Sander
Mattison No. 124 Automatic Stroke Sander
Pearson Waterfall Sander
Oakley Model E Double Sander

BAND SAWS
Mershon 46" Band Resaw
American 44" Band Resaw
American 40" No. 4 Band Resaw
36" Yates-American Motor Driven Ball Bearing Band Saw
Berlin 44" No. 283 Band Resaw

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Beach No. 3 Roller table double cut-off saw
Fay & Egan No. 501-A Direct Motor Driven Ball Bearing Swing Saw
Eaglesfield Direct Motor Driven Ball Bearing Swing Saw
Porter Straight Line Cut-Off Saw

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Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw
Yates-American G-67 Chain Feed Rip Saw
Dependable No. 1 BB Gang Rip Saw, Power Feed

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Onsrud W-240 Electric Router
Yates-American U-9 Electric Router

SHAPERS
Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Onsrud W-125 Double Spindle Automatic Shaper
Onsrud W-125 Single Spindle Automatic Shaper

TENONERS
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Wilkins-Challoner No. 70 Elec. Dbl. End Tenoner
Jenkins No. 95 Electric Double End Tenoner

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Coe 88" Clipper
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- Universal Woodworkers

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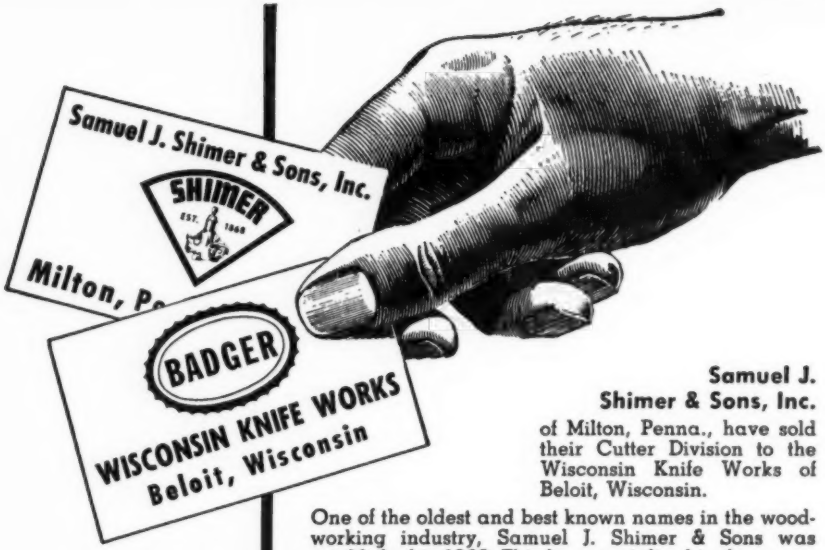

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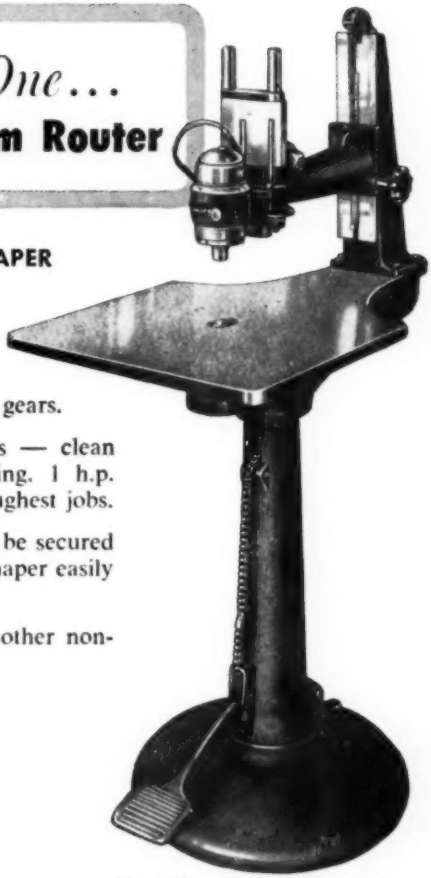

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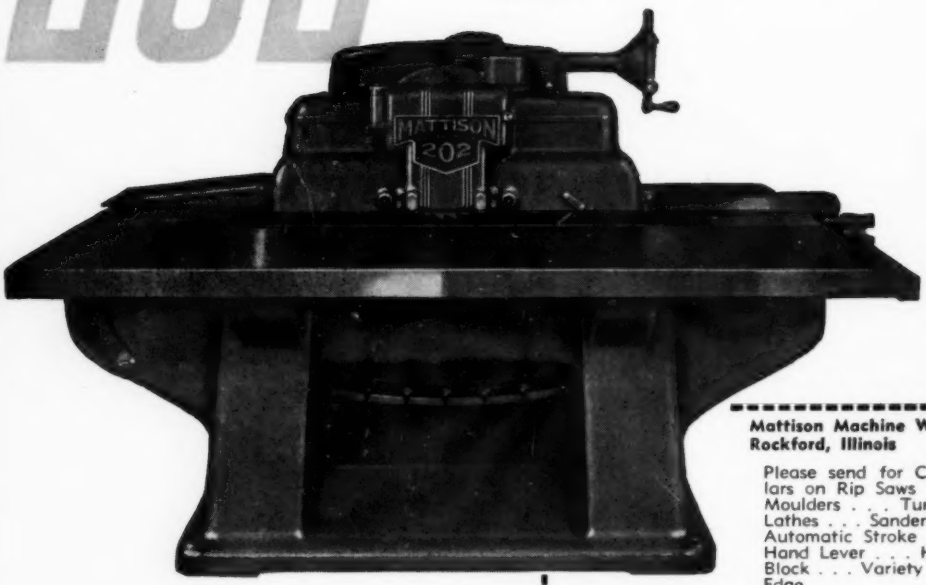

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